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No. 1365  
Vol. XXVII

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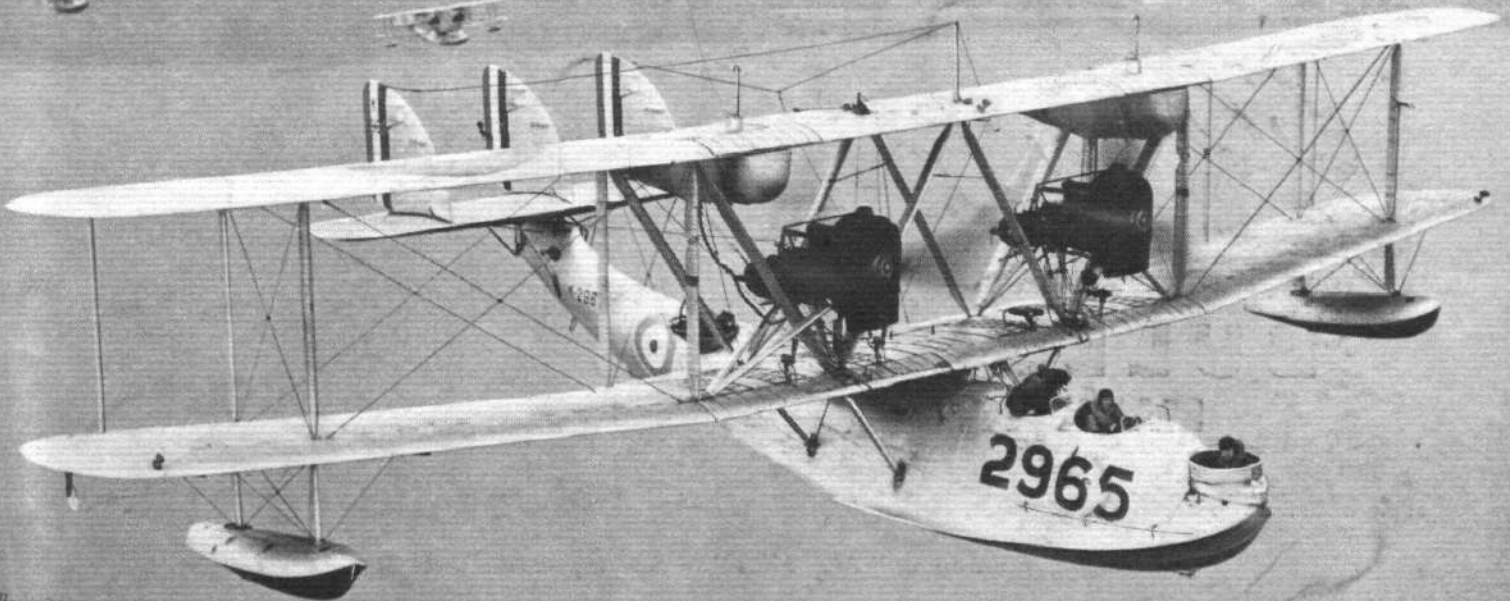


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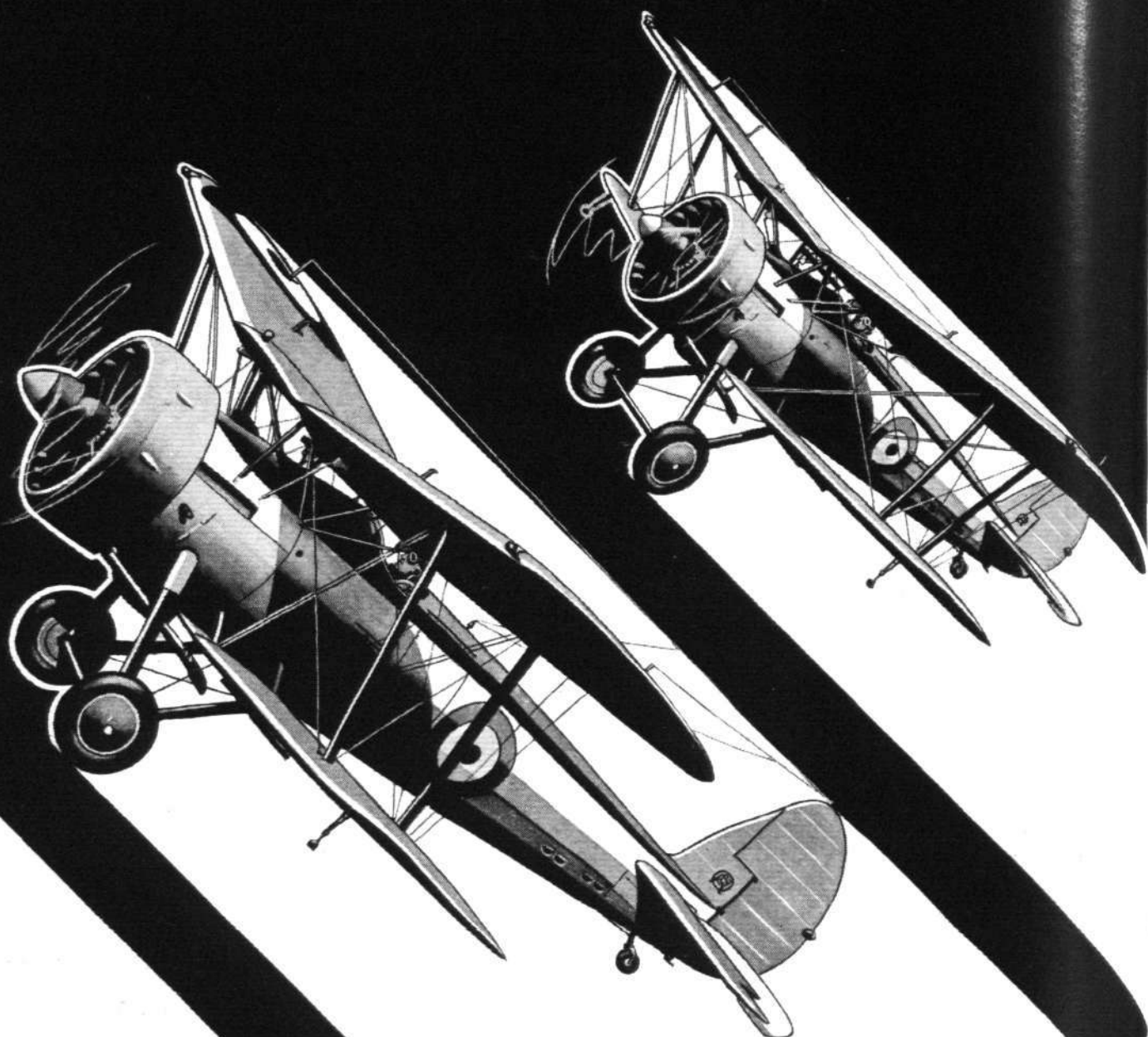


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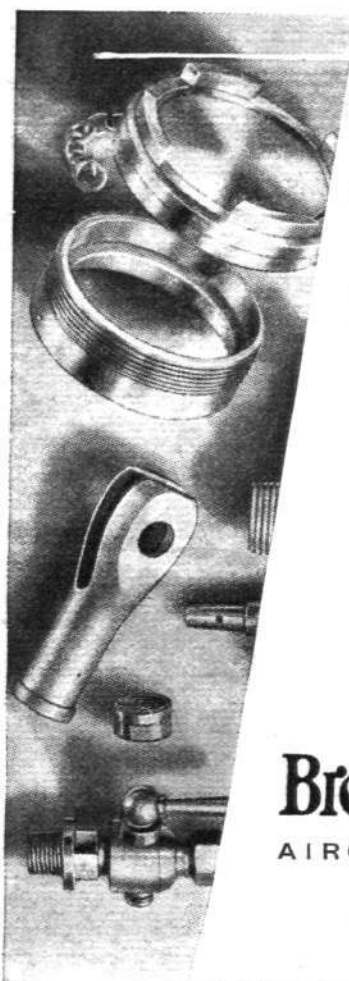
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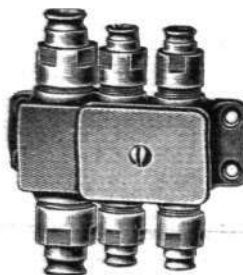
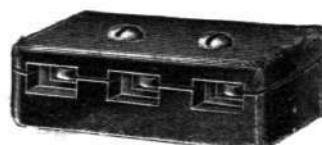
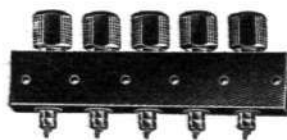
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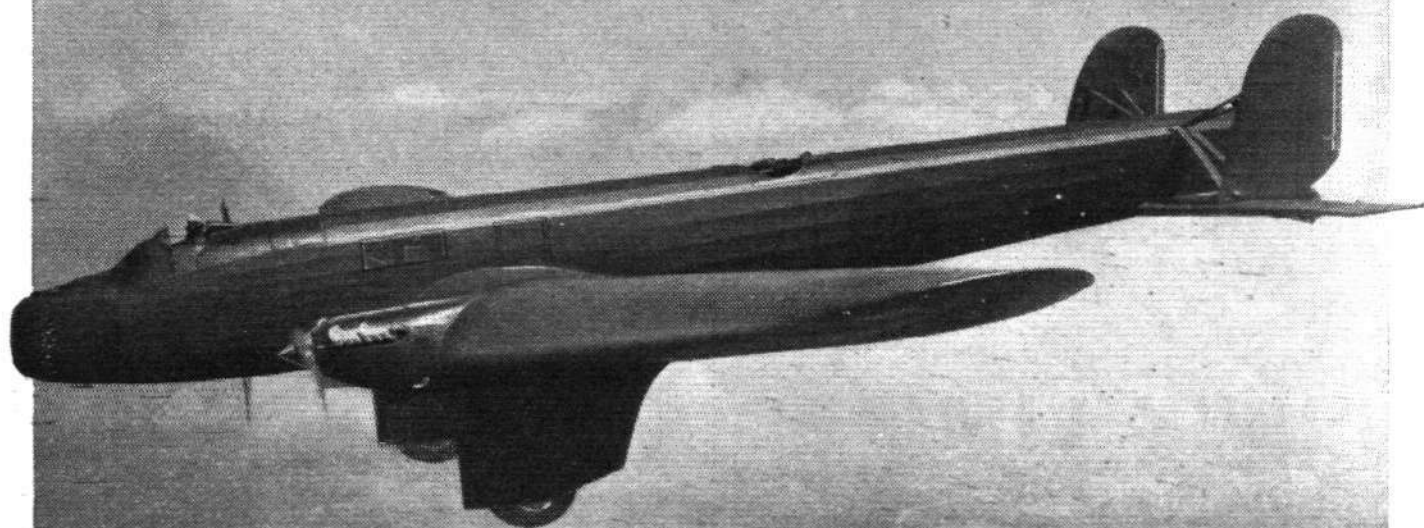
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Founded in 1909

FIRST AERONAUTICAL WEEKLY IN THE WORLD

OFFICIAL ORGAN OF THE ROYAL AERO CLUB

No. 1365. Vol. XXVII.

FEBRUARY 21, 1935

Thursdays, Price 6d.  
By Post, 7½d.

Editorial, Advertising and Publishing Offices: DORSET HOUSE, STAMFORD STREET, LONDON, S.E.1

Telegrams: Trulitur, Watloo, London.

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## A Black Week

IN one week the flying world has experienced three failures by aircraft of the trans-oceanic type. First, the U.S. naval airship *Macon* came down on the surface of the Pacific ocean and was wrecked, with a loss of two lives. Then a British flying boat engaged on a delivery flight to Singapore flew into a mountain in a fog and the nine men on board all perished. Finally, the French aeroplane *Joseph le Brix*, piloted by Capt. Rossi and Lieut. Codos, developed lubrication trouble when attempting to cross the Atlantic from France to South America, and just struggled back safely to the Cape Verde islands. Fortunately, in this last case there was no loss of life.

The British disaster was the most tragic, although there is no mystery about it. One may wonder why the pilot was not flying higher when in the neighbourhood of mountains wreathed in fog, but there may have been reasons which seemed sufficient to a man of experience. The American loss is somewhat of a mystery, and without knowing the full history of the airship *Macon* one cannot say anything definite about it. It has been reported that both she and her sister ship, the *Akron*, worked out heavier in structure weight than had been allowed for. The same happened in the case of our *R101*, and from that fault arose the sequence of events which led to her destruction. The *R101*, however, was very strong, whereas it would seem that part of the framework of the *Macon* gave way under some heavy strain, and the broken parts of the frame ripped two of the helium cells and caused the tail to sink. No praise would be too high for the airmanship of Lt.-Commander Wiley in bringing his ship down on the water and saving all of his crew except two, one of whom deliberately jumped overboard. He has well deserved the promotion which has been given him.

It is only fair to remember that both the *Akron* and the *Macon* were experimental airships. All large rigidships have been experimental—even the very successful *Graf*

*Zeppelin*. The new larger Zeppelin, which we understand is to be called the *Hindenburg*, will be a further stage in the series of experiments. The Germans, however, have far more experience than anyone else, both in building and in constructing airships. The one American airship which was completely successful, the *Los Angeles*, was built in Friedrichshafen. That may have been a coincidence, for the three great American airship disasters, to the *Roma*, the *Shenandoah*, and the *Akron*, were not due to faulty construction so much as to faulty organisation or airmanship.

As a commercial form of aircraft the airship is now almost being threatened in range and capacity by the flying boat, which far surpasses it in speed. How the competition will end depends chiefly on Dr. Eckener and his supremely skilful coxswains and crews. Where the airship is probably irreplaceable is as a naval scout, patrolling the trade routes of the ocean, far outside the range of aeroplanes, and herself carrying aeroplanes on board. As a partial substitute for cruisers, the most expensive airship would be, so to speak, dirt cheap. Dr. Eckener has given every proof that airships can be navigated safely by experienced hands with the help of adequate meteorological information and other organisation, and he will not be deterred from continuing his experiments with larger craft by the errors in construction and the errors in airmanship of other nations.

## "A Dictator's Rights"

WHEN a headline appears in a popular Sunday paper, to wit, the *Sunday Dispatch*, "Britain Awakes—League to Conquer Air Peril," what deduction can be drawn except that here is another attempt to coerce the Government? It is undoubtedly the duty of the Government to preserve the country from the air peril and all other perils from the King's enemies, and the present Government has been exceptionally busy on that matter. *Flight* was never a firm believer in the utility of the Geneva attempts at air

disarmament, still less in the unilateral disarmament of Britain. When the Government decided that such efforts were fruitless and dangerous, it proceeded at once to a very considerable increase in the Home Defence Air Force. In addition to that, the Government is now busy negotiating a peace pact with France, Germany, Belgium, and Italy, which holds out the highest promise of averting any air peril which might otherwise have existed. At such an inopportune moment as this a section of the popular Press announces that it is founding a league of airmen to "conquer the air peril."

If the object of this agitation by one group of newspapers is to force the Government to increase the Air Force to a degree beyond what is necessary for the needs of the time, it will certainly fail. If it were to succeed it would do a very poor service to the long-suffering taxpayer. Armaments are necessary as an insurance policy up to a reasonable point. Anything beyond that point is an extravagance, and extravagance is apt to increase the income-tax. If such a deplorable result were to follow from this agitation, who, we ask, would be more prompt than this very section of the Press in raising the wail of discontent?

It is very desirable that the steady growth of air-mindedness in the country should be accelerated. Any

person or body who spreads wider the gospel of the air is doing good work. *Flight* has already admitted that this side of the objects of the new League of Airmen is good. The Air League of the British Empire, in the open letter which appears on another page of this issue, also approves of that side of the objects of the new league. The Air League of the British Empire, now in its silver jubilee year, has for long been doing good work in spreading the air gospel. Since its executive council was recently reconstituted so as to include representatives of the Royal Aeronautical Society and the Royal Aero Club, at the same time securing the extremely valuable services of Air Commodore Chamier as Secretary General, the Air League has increased in energy, in wisdom, and in public utility. Its lecturers have been busy for years. It has instituted Empire Air Day. It has started a scheme for helping lads to learn to fly. It deserves the support of the nation, and the contemptuous way in which the new organisation has assumed for itself "a dictator's rights in air matters" (we quote the words of Air Commodore Chamier), to the utter disregard of the existence of the older body, is not to be excused. In one way, the new body may do good, but there is such a thing as doing good that evil may come.



**STEEL AND STONE :** A fine pictorial impression from New York's East River airport. The nose of the Bellanca seaplane silhouetted against Manhattan's skyscrapers is photographically effective, but a trifle disconcerting, perhaps, to the eye of the all-weather pilot ! The airport was described in *Flight* of February 7.



# The Outlook

## A Running Commentary on Air Topics

### Accident Reports

ON several occasions *Flight* has asked that official reports on flying accidents should be issued as soon as possible. That far too long a period still intervenes between the occurrence of an accident and the issuing of a report on it seems to be indicated by an official Air Ministry report issued early this week concerning the accident to a "Fox Moth" at Dundee temporary aerodrome, in which two passengers were killed. The accident occurred on July 31, 1934. The machine was engaged in flying for hire, and soon after taking off it lost height and ultimately came into collision with a belt of trees at the foot of a hill bordering the side of the aerodrome. The Inspector of Accidents came to the conclusion that the machine encountered a down-current, but that the pilot was taking a somewhat unnecessary risk in turning near the ground, towards the hill bordering the leeward side of the aerodrome.

One may readily imagine circumstances in which the collection of evidence, and even the inspection of wreckage, may be surrounded by very serious difficulties, but it is not easy to see why it should take more than six months to come to the conclusion that the accident quoted was caused by a down-current. It is to be hoped that the official report on the recent Autogiro accident at Old Sarun will be issued quite soon. There is cause to believe that the aircraft was not to blame, but until this is made clear by an official finding, the machine is likely to be rather under a suspicion which may be quite groundless.

### Interchangeability

IS it not high time that steps were taken to ensure that certain items of aircraft equipment were interchangeable? For example, take engine-driven electric generators. Engine makers do not, themselves, make the generators, but only provide the fitting. Why should the purchaser of an engine be forced to use one type of generator just because it is the only one which will fit that engine? The same objection applies in the case of many other parts, which, if their bases, fittings, or certain main features were standardised, could all be used on each and every engine.

The argument, too, can be applied to aeroplanes themselves. There are many parts which are made by many different makers, and are all different in their details. Surely this is a question which the Society of British Aircraft Constructors might take up with the British Standards. It is done in other trades, as, for example, with electric fittings; why not with aircraft and aero engines?

### Sky Sense

TODAY, with the air becoming mildly crowded in the vicinity of aerodromes, it should not still be necessary to warn private pilots of the necessity of keeping a good look-out, especially in conditions of bad visibility. Nevertheless, the sky is apparently boundless, aeroplanes are often distressingly blind from the pilots' point of view, and a spring day is conducive to joyous work with the controls.

Once last year a member of the staff of *Flight* left an aerodrome of no commercial importance, climbed to an eminently respectable height, and practised stalled turns at an equally respectable distance from the aerodrome. Tired of these entertaining and useful tricks, he had just

pulled the machine over in the first half of a loop when another machine was noticed directly below. It was certainly not in the vicinity when the private aerobatic display had been opened, and later conversation showed that its pilot had never seen his fellow-clubman, whose machine, incidentally, was heavily staggered, giving a good view earthward in the inverted position. The two aircraft, in fact, possessed totally different "characteristics of useful view."

Let us, for the sake of the general public, if not for our own, do our best to keep the 1935 season free of those serious accidents resulting from the "I-was-looking-over-the-other-side" method of piloting.

### Skin Stressing

ELSEWHERE in this issue are further details of a low-wing monoplane which has an unusually creditable ratio of gross weight to tare weight. The designer of the machine—the De Bruyne "Snark"—claims to have achieved this by full allowance for the strength of the plywood covering both of the wing and of the fuselage. It yet remains to be seen whether his design will stand up to ordinary hard wear or whether the assumptions he has made have resulted in a structure which, although strong enough for flying, may be too flimsy for the rack it has to withstand on the ground.

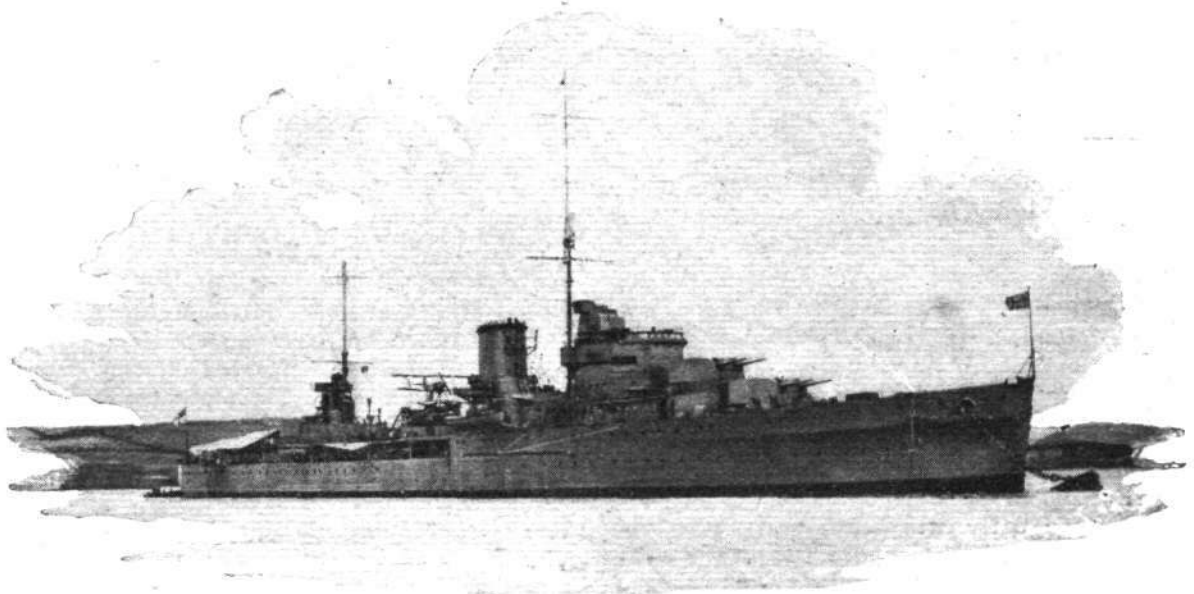
The subject of due allowance for the covering of wings and fuselage is receiving intensive investigation at the Royal Aircraft Establishment and, as the use of stressed-skin covering is growing every day, it is to be hoped that a report giving basic working figures will soon be issued.

### The Ice Menace

UNTIL the present winter, during which many of our internal air lines have been flying regular skeleton services, comparatively little had been heard of the problems of ice formation in this country. Test pilots had encountered it, charter pilots had been forced down on occasion, and the early morning newspaper experts could probably, if they felt so inclined, write epics which might be of greater value than any article dealing only with theoretical considerations.

In this country it is usually possible to fly under if not over ice-forming areas. High mountain ranges are few, but the introduction of an adequate system for full blind landings will mean that sooner or later in the course of many long winter flights, the pilot must fly through a danger area. He may come down through clouds with an aeroplane already below freezing point, or he may find it imperative to fly through a cold cloud layer. The tendency towards the increased development of all-metal stressed-skin types possibly makes the necessity for action even greater, though choked pilot heads and venturi tubes and ice-coated airscrews alone have sufficiently serious consequences. In this issue of *Flight* we publish an article dealing with the major causes of ice-formation as they are found by American operators and with some of the better-known measures for prevention and cure. Much of the interest lies in the fact that, given sufficient meteorological information, a pilot can always fly at such a height and on such a course that the ice-removers should only occasionally be needed.

Before the next winter season, it is hoped, all machines used on regular services will be fitted with ice-removers or ice-preventers.



# H.M.S. LEANDER

## No. 407 (Fleet Fighter) Flight

By Major F. A. de V. ROBERTSON, V.D.

**I**N the days when Gilbert and Sullivan produced the opera *H.M.S. Pinafore* the word "cat" suggested to the mind the "merry cat o' nine tails and the tar."

In the modern Navy the word cat. (with a full stop) has a meaning not dreamed of in the philosophy of Gilbert. It is the inevitable abbreviation for the catapult used for

launching seaplanes into the air from cruisers and capital ships.

The provision of aircraft for the use of the Royal Navy has always presented certain technical difficulties. Before the war and in the early days of the war it seemed natural that the Navy's aircraft should be twin-float seaplanes.

Seaplane design was then in its infancy, and the floats in particular were fragile and not very efficient. There were quite a number of occasions when seaplanes were lowered



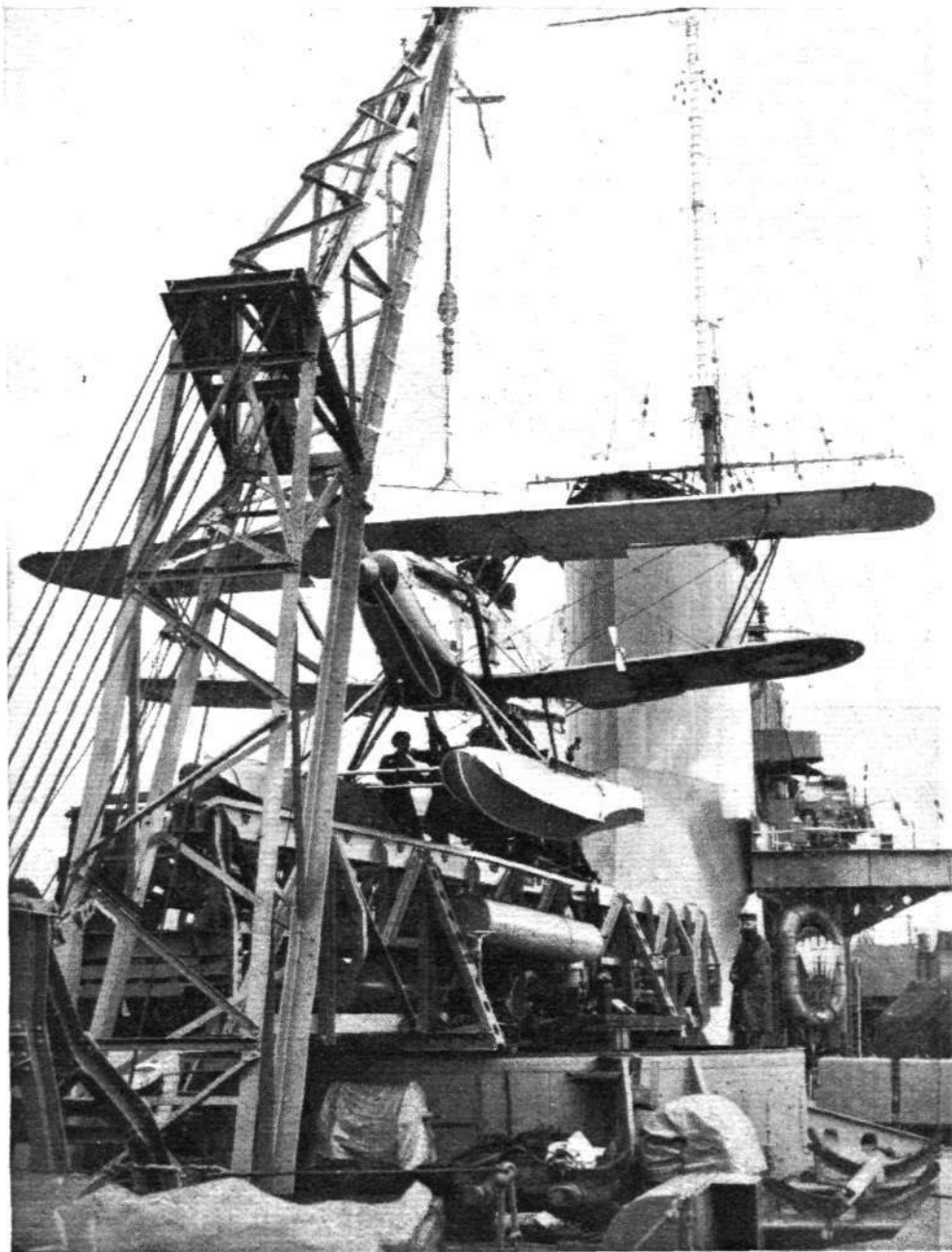
The catapult extended in both directions, and the Hawker "Osprey" ("Kestrel" engine), heading into the wind. The Forth Bridge is in the background. (Flight photograph.)



into the sea from naval ships and then proved unable to take off from the rough water. Sometimes the floats were smashed by the waves, and the pilots had to be hurriedly rescued. Lifting the seaplanes on board again after a flight was also a difficult matter in rough weather.

At the time of the battle of Jutland on May 31, 1916, there were two seaplane-carriers with the Fleet, H.M.S. *Campania* with Admiral Jellicoe at Scapa Flow, and H.M.S. *Engadine* with Admiral Beatty at Rosyth. The *Campania* did not receive her sailing orders until it was too late to catch up with the Grand Fleet, and she took no part in the battle. The *Engadine* sent up one seaplane during the battle, a Short, piloted by Flight Lieut. F. J. Rutland, with Asst. Paymaster G. S. Trewin as observer. It took twenty-eight minutes from the receipt of the order before they were in the air. After sending back three wireless messages, which do not seem to have reached the *Lion*, a petrol pipe broke on the seaplane and Rutland was forced down. He repaired the damage with rubber tubing, but was ordered to go alongside the *Engadine* and was hoisted on board. After that the weather was judged to have become too bad for flying.

By February of 1917 the practice of flying seaplanes off the deck of the *Campania* had been introduced, but it was only possible to take off against a strong wind. Light fighter aeroplanes, Sopwith "Pups," were then used for flying off decks, but they had to come down in the water beside a ship, and, though the pilot was usually rescued, the aeroplane was often lost. Catapults, driven by compressed



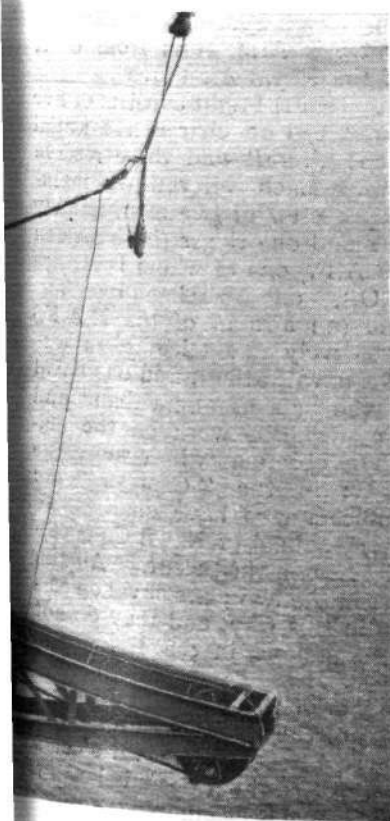
The catapult retracted and the aircraft being lowered on to it by the crane.  
(Flight photograph.)

air, were experimented with in 1917, and both landplanes and seaplanes were successfully launched by this means; but the apparatus was heavy, and the experiment was abandoned in favour of the practice of flying fighters ("scouts," they were then called) off platforms on cruisers. A dramatic success brought this method into further favour. On August 31, 1917, Flight Sub-Lieut. B. A. Smart flew a "Pup" off H.M.S. *Yarmouth* and shot down the Zeppelin L 23. He then put his "Pup" down in the sea beside H.M.S. *Prince*, and was himself taken on board, while the machine was lost.

The next development was the equipment of H.M.S. *Furious*, a large light cruiser, with a flying deck on which returning aeroplanes could land. From that time onward until a few years ago the carrier with a flying deck was considered not only the standard but the sole means of supplying the Fleet with aircraft. The carrier still remains a standard component of a Fleet, but it is no longer the sole method of getting naval aircraft into the air.

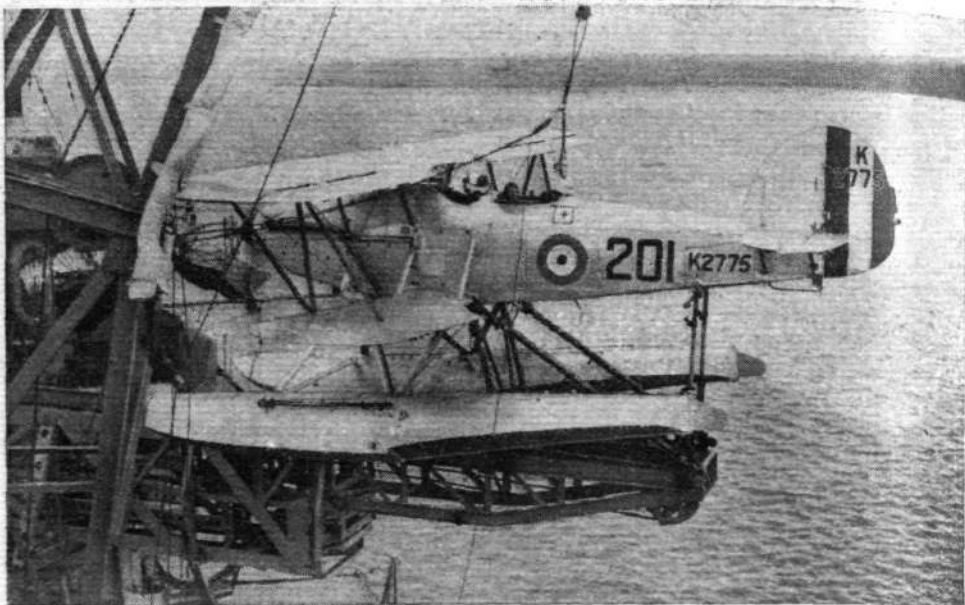
Aircraft carriers must needs be large and expensive. There must be many occasions on which a cruiser squadron, for instance, cannot be accompanied by a carrier, but may still have need for the services of aircraft. Moreover, a carrier may be put out of action if her flying deck is bombed, and then all the eggs would have to remain in the basket. A single cruiser patrolling the trade routes can reconnoitre far more square miles of sea in a day if she can send up an aircraft. In fact, a few years ago a move was made to resume the experiments with catapults which had been begun and abandoned in 1917.

Catapults were accordingly evolved of a suitable type and a suitable weight. Both compressed air and cordite were tried as the means of propulsion, and the latter has given the best results. It is more gradual in accelerating the catapult up to full speed, and so imposes less strain on both the aircraft and the crew. It was, of course, necessary

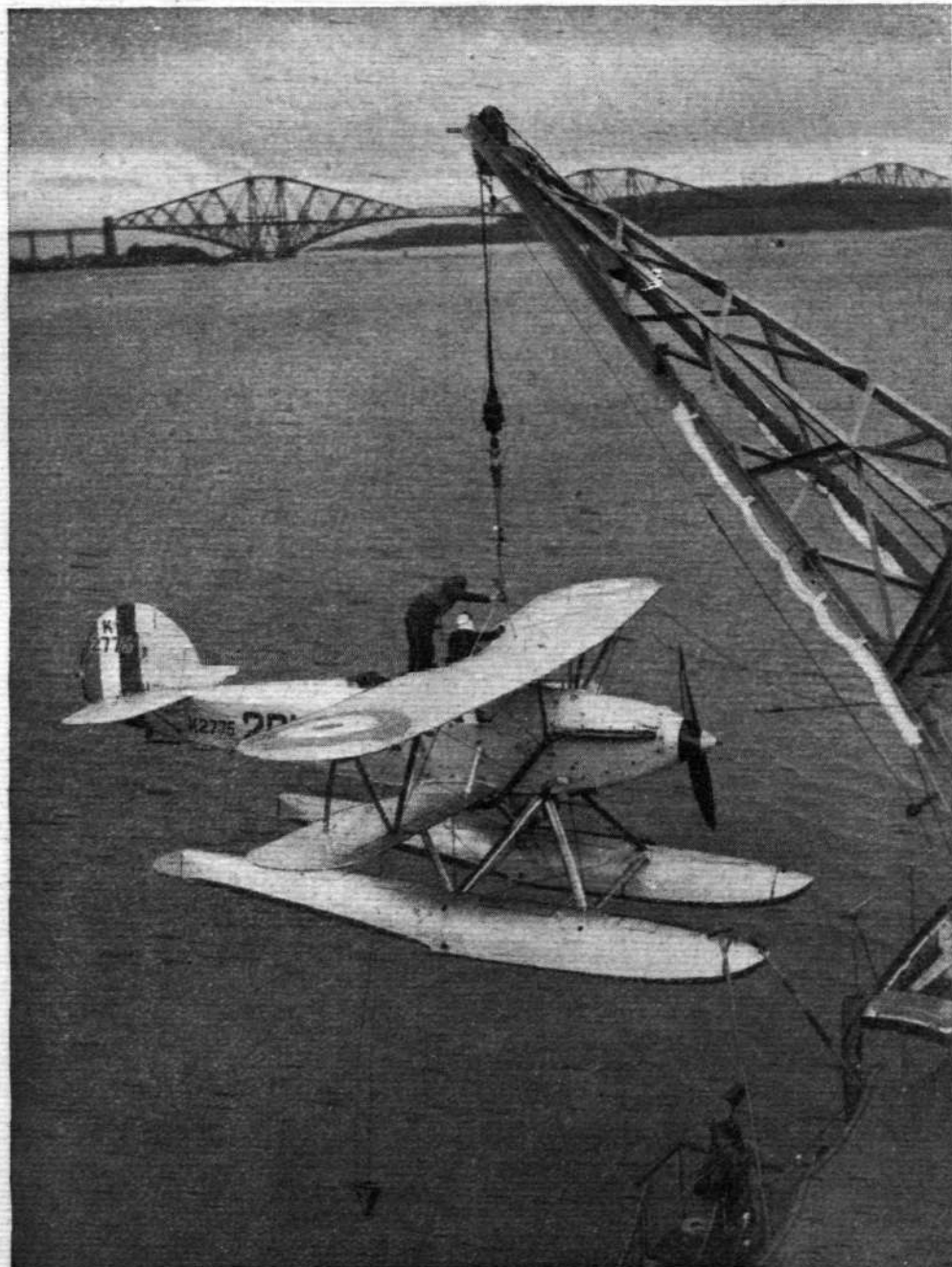


that the aircraft used should be twin-float seaplanes, for they cannot land on a cruiser or a capital ship at the conclusion of a flight; they must alight on the sea beside the ship and be hoisted on board. Since the Armistice there has been a very great advance in the design of floats, thanks in no small measure to the impetus given by the Schneider contests. Floats are now invariably made of metal—duralumin, stainless steel, or alclad. Corrosion due to the action of the salt water is a problem which is now well on its way to complete solution. Floats will not now break up, or undercarriages give way, in any ordinary sea such as makes a take-off possible. At present all the cruisers and capital ships of the Royal Navy are in process of being fitted with catapults and seaplanes.

By kind permission of My Lords Commissioners of the Admiralty, representatives of *Flight* were recently



Ready to take off: The "Osprey" at the rear stops of the catapult with engine running and pilot and observer bracing themselves in the cockpits. (*Flight* photograph.)



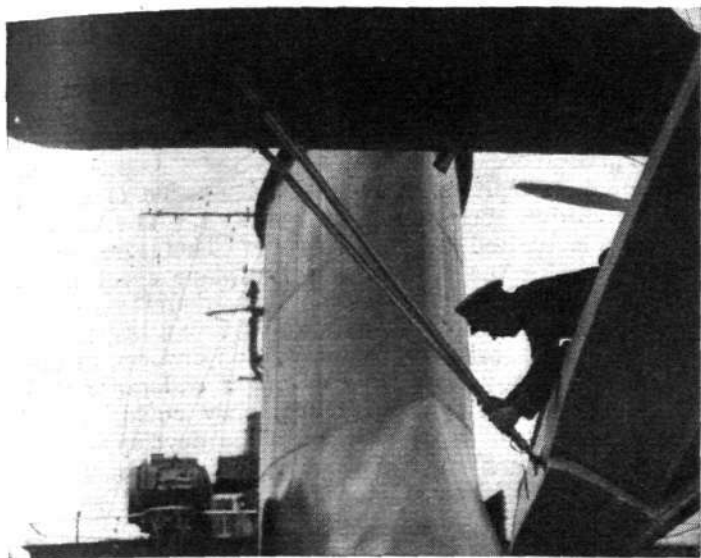
Up she comes: The observer has attached the lifting tackle and the crane is raising the aircraft out of the water. (*Flight* photograph.)

permitted to pay a visit to H.M.S. *Leander*, flagship of the 2nd Cruiser Squadron, then in the Firth of Forth off Rosyth. The 2nd Cruiser Squadron consists of H.M.S. *Leander*, *Neptune*, *Achilles*, and *Orion*, all 7,000-ton cruisers. The *Achilles* has two aircraft on board and the other ships have one each. The aircraft are all Hawker "Ospreys" with Rolls-Royce "Kestrel" engines, and are two-seater floatplanes of the fighter-reconnaissance class. They belong to No. 407 (Fleet Fighter) Flight, R.A.F., of the Fleet Air Arm. The catapult floatplanes are all organised in flights, whereas the landplanes on the carriers are organised in squadrons. The flights are all numbered from 403 upwards and the squadrons from 800 upwards, which serves to distinguish the Fleet Air Arm units from other units of the Royal Air Force.

No. 407 (F.F.) Flight consists of five pilots, and has on charge five initial equipment aircraft and three reserve machines. Each aircraft is maintained by a crew of five men, namely one fitter and one rigger (both airmen of the R.A.F., one of whom is always a N.C.O.), one wireless operator-mechanic (an airman of the R.A.F.) or alternatively one telegraphist air-gunner (a naval rating), and one naval rating, who acts as aircraft-hand and does the unskilled work on the machine. The observers who occupy the back seats in the "Ospreys" are ship's officers who have qualified at the R.A.F. School of Naval Co-operation at Lee-on-the-Solent. All air observers in the Navy are naval officers qualified in this way, and they do not hold commissions in the Royal Air Force.

The pilots of the Fleet Air Arm are all officers of the Royal Air Force, but 70 per cent. of them are naval officers who for the time hold commissions in the R.A.F. The remaining 30 per

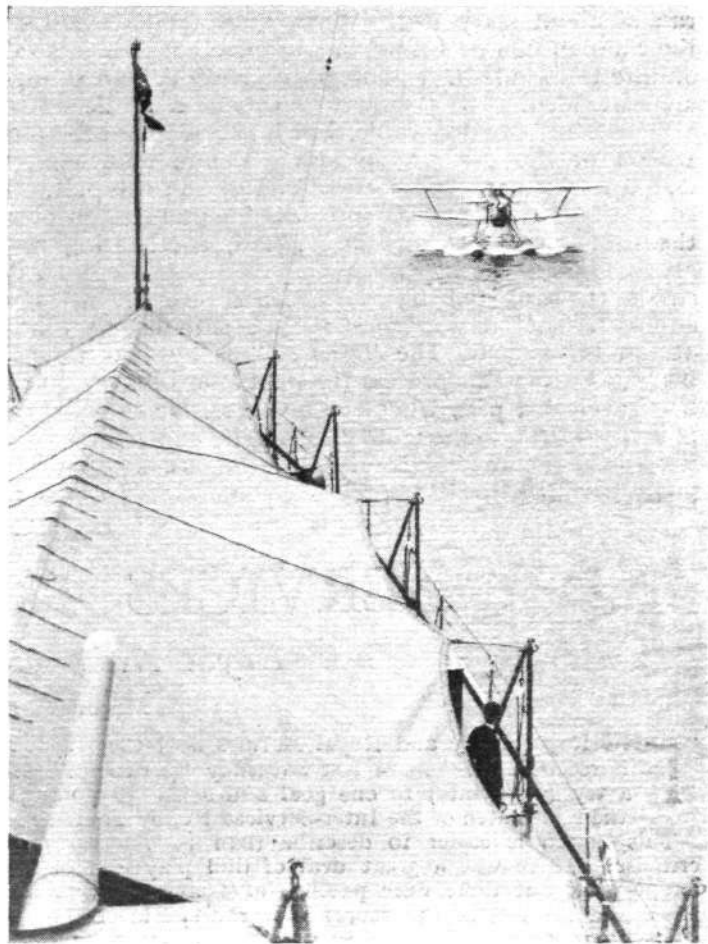




The rigger removing jury struts before a flight. (*Flight* photograph.)

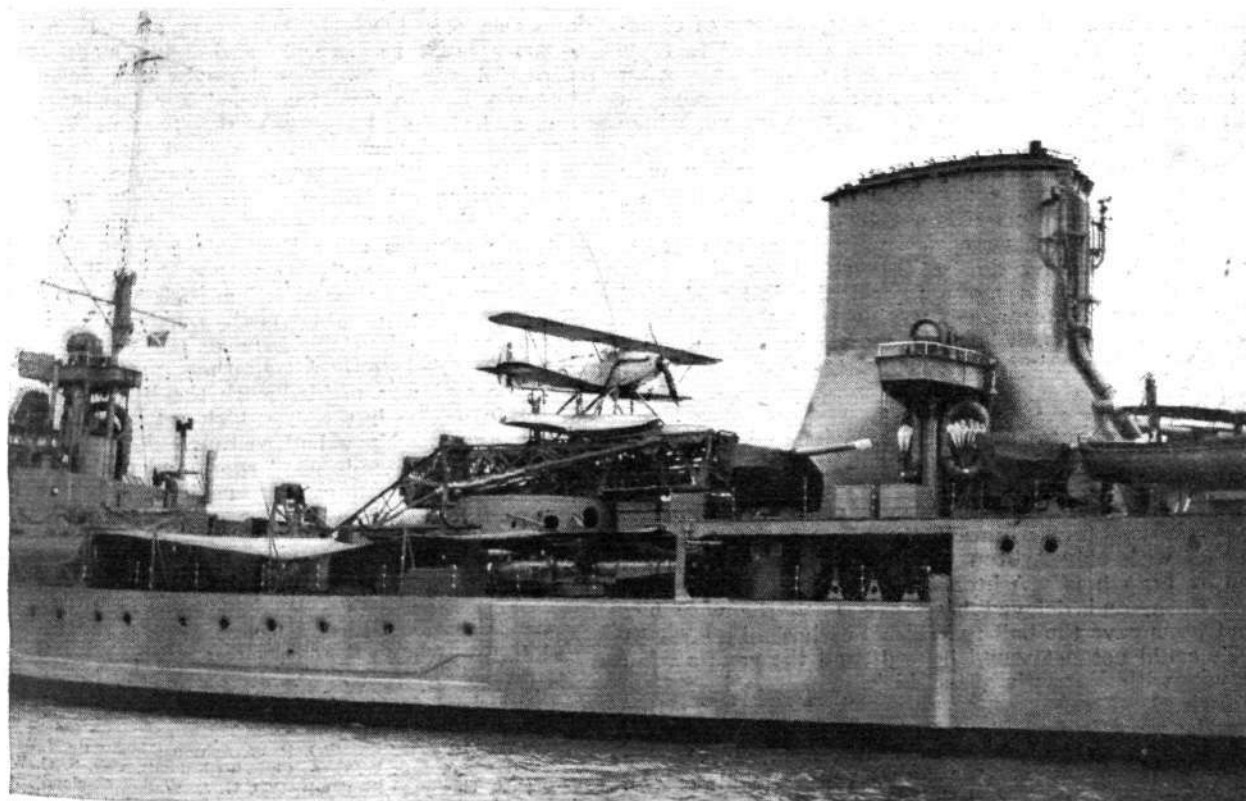
cent. are R.A.F. officers pure and simple. In the carriers both classes of pilots are found, but in the flights which fly the catapult floatplanes off cruisers and capital ships it is the custom that the pilots should invariably be naval officers holding Royal Air Force commissions. When not engaged on flying duties they are available for ordinary ship work, taking watches and so on. The R.A.F. commissions are necessary because when the flights are on shore stations—Lee-on-the-Solent, Gosport, Upavon, and Leuchars, etc.—they come under Air Ministry administration and are under the command of senior officers of the R.A.F.; also, because when in their ships they have airmen under their command. When afloat all the units of the Fleet Air Arm are under the Admiralty for operations. It may be noted that the floatplane flights are not under the orders of the Rear Admiral (Aircraft Carriers). They are entirely under the orders of the Admiral commanding their own squadrons.

The seaplanes are always stowed on the catapults. As



AFTER THE FLIGHT: The "Osprey" is taxiing back to be hoisted on board. (*Flight* photograph.)

our photographs show, these are placed high above the decks, but even so in very bad weather the spray sometimes reaches up to the aircraft. The *Leander's* catapult is of the E3H2 type, made by the firm of MacTaggart Scott, of Loanhead. It can be extended at each end to give a



The aircraft stowed in its fore and aft position on the catapult of H.M.S. *Leander*. (*Flight* photograph.)

run of about sixty feet. When both ends are retracted the catapult can be turned in any direction to give a take-off into the wind. Our photographs show it both retracted and extended. The "Osprey" rests on a cradle which is attached to an endless cable, which passes round the pulley wheels of the discharging ram. Before launching, the cradle is run back to the rear end of the catapult. The cordite charge is inserted and fired by order of an officer, the cable draws the cradle forward, accelerating up to about 48 knots (it may be up to 56 knots in a heavier type catapult) until the front stops are reached, when the aircraft is shot forward into the air with engine running at full revolutions. The "Osprey" is by that time airborne. During this process the pilot keeps his head firmly back against a pad, while the observer, facing aft, braces himself against the rear of his cockpit, and neither is any the worse for the shock of the rapid acceleration. The pilot who flies the "Osprey" off the *Leander* has now

been catapulted over a hundred and twenty times, and thinks nothing of it.

The functions of catapult floatplanes cannot yet be said to be cut and dried. When a cruiser is working singly on a trade route, the seaplane would be used for general reconnaissance. In a fleet action the "Ospreys" might be used as fighters, though the possession of floats does not improve their aerobatic qualities. The use of seaplanes is limited by the weather. There are degrees of roughness in the sea when a floatplane could not make a safe landing after its flight. It is, therefore, under consideration to experiment with amphibian flying boats, such as the Supermarine "Seagull V," on cruisers, as they are more seaworthy and have a longer endurance than the floatplanes. Being amphibians, they could be used on carriers as well as on cruisers. The development of this catapult branch of the Fleet Air Arm should be very interesting to follow.

## THE SERVICES RUGBY TOURNAMENT

### *Royal Navy versus Royal Air Force*

By Major F. A. de V. ROBERTSON

THE Royal Navy and Royal Marines beat the Royal Air Force at Twickenham last Saturday by two goals and a try (13 points) to one goal and a try (8 points) in the first match of the Inter-Services Rugby Tournament.

This match is easier to describe than to summarise and criticise. There was a great deal of dull play and of indifferent play, but there were patches of excitement and brilliance, and the run of the scores kept the spectators guessing right up to near the end as to which side would win. The best conclusion is that this R.A.F. XV of comparative novices showed possibilities of becoming a really first-rate side.

The day was gloomy and overcast, with a strong west wind blowing. By the time this wind had got round the stands it was doing all sorts of peculiar things, and often the corner flags at the two ends of the ground were blown in opposite directions at the same time. Consequently no one could foretell what would happen to a kicked ball.

Both sides started in uncertain mood. Tackling and passing were alike wobbly. In the first two minutes an airman wrapped himself (apparently) firmly round one of Lane's legs, but still allowed the Navy three-quarter to wriggle free and run on. As a result Wheadon nearly got over for the Navy. Other R.A.F. tackling showed an equal lack of cleanliness and firmness. The wind kept bringing the ball to Lane on the Navy's right, and he was always dangerous. After ten minutes the R.A.F. improved, and some pretty passing on their right took the game into the Navy's twenty-five, where Simmons missed a shot at a penalty goal. Five minutes later he had another free kick from farther out, and made a very good shot. The game was going to and fro, with nothing much in it. The R.A.F. forwards got their share of the ball in the scrums, but heeled very slowly. In spite of this, Parker and G. A. Walker did some very clever things in getting their three-quarters moving, and the latter showed skill in handling and enterprise in trying to make openings. The Navy three-quarters, who had more chances, usually made a hash of their passing and bunched together.

#### Scoring Begins

After twenty-six minutes of rather dull give-and-take play, suddenly the Navy scored a try, though the reason why they did so would be rather hard to find. It was chiefly a matter of good backing up. Lane, running with rather less than his usual determination, found himself (that seems the best way of putting it) with only Ashton in front of him and at least three men at his elbow. Ashton made a really noble effort to confuse them, and delayed his tackle until the very last second, but Lane gave the ball to Walsham who had a straight run in. He could not get round behind, and the erratic wind played havoc with Forrest's place kick.

A rash kick ahead gave Gosling an excellent chance to drop a goal, but he too failed to allow for the wind.

At that point the R.A.F. suddenly became inspired. A very good combined movement to the right took them almost on to the Navy's line, and though the Navy cleared for a moment, Morgan sent the ball back with a clever kick. The pressure was kept up, and resulted in G. A. Walker going over for

a very good try. The wind did not prevent Simmons placing a fine goal, and the Air Force took the lead at 5-3.

A quarter of an hour later came the most sensational incident of the match. A kick ahead by the Navy was fielded by Ashton well inside his own twenty-five. Three Navy men confronted him, but he cut across their bows. Amid shouts from the spectators of "kick" (which seemed the wisest thing to do), Ashton brushed aside two or three half-hearted tackles and then a great gap yawned before him. Increasing his pace, he went right through it, past the half-way line, into the Navy twenty-five, with his own three-quarters falling into line beside him. It was a glorious run and quite unexpected. Then his pace began to flag, so he gave the ball to S. G. Walker, and he to Thompson, who scored far out. The kick failed, but the R.A.F. now looked almost certain winners. Half-time was whistled with the score at 8-3.

In the second half the Navy in turn woke up, and instead of half-hearted running and fumbled passes, we saw at last what they really could do. The skill and pace of their attacks broke up the formation of the defence, and only desperate tackling by R.A.F. individuals, running across the field, prevented a really big score from mounting up. First Wheadon got away and passed to Lane (it is not very often that one wing three-quarter feeds the other), and Lane made one of his very thrustful runs. Someone brought him down near the line, but too late to save the score, for Darling went over for a try, and Gosling kicked a goal. That made the scores equal. Soon after Sladen broke clear and sent Lane off again, but the latter was firmly grounded this time. The Navy forwards were getting the ball out well at this period, but one chiefly admired the smart opportunism of the Navy men.

Seven minutes after Darling's try the Navy kicked ahead and followed up well. Lane got the ball and made another great run. This time Watkins took his pass and scored, and Gosling kicked another goal, putting the Navy ahead by 13-8, and settling the issue of the match.

Ashton tried to make another run, but chose the wrong occasion and was tackled with the ball. This almost let the Navy in again, but a free kick set the Air Force attacking again, and the Navy had to touch down. S. G. Walker and Church in turn made good runs, and one airman tried a drop at goal, but the Navy defence held. Ashton made another run, and set his three-quarters going, but all was of no avail.

The teams were:—

ROYAL NAVY.—Lt. C. G. Gosling (H.M.S. Galatea); Lt. H. J. F. Lane (R.A.F. Station, Netheravon), Ldg. Seaman C. Criddle (R.N. Bks., Devonport); Lt. G. M. Sladen (H.M.S. Titania), Lt. G. M. Wheadon (R.N. Bks., Portsmouth); Lt. J. S. W. Walsham (R.N.C., Greenwich), Sub-Lt. S. V. Welch (R.N.E. College, Devonport); Lt. I. G. Avlen (R.N.C. Greenwich), Schoolmaster D. J. Tarr (H.M.S. Excellent); Lt. E. G. Nixon (R.N.C., Greenwich), Lt.-Cmdr. J. W. Forrest (H.M.S. Curacoal, (capt.), Marine G. Webb (H.M.S. Caledon), Pay. Sub-Lt. J. K. Watkins (R.N. Bks., Devonport), Sub-Lt. G. P. Darling (H.M.S. Dolphin), Lt. R. J. L. Hammond (H.M.S. Excellent).

ROYAL AIR FORCE.—P/O. P. W. Ashton (Manston); L.A/C. W. R. Morgan (Worthy Down), P/O. W. C. A. Church (Sealand), P/O. S. G. Walker (Cranwell), P/O. J. M. Thompson (Sealand), P/O. G. A. Walker (Sealand), P/O. J. L. Barker (Catterick); L.A/C. A. E. Simmons (Henlow), L.A/C. W. V. Reynolds (Henlow), P/O. R. H. Waterhouse (Donibristle), L.A/C. D. C. Muirhead (Norfolk), Flt. Lt. C. E. St. J. Beamish (Digby), (capt.), P/O. R. H. S. McConnell (Mt. Batten), F/O. J. S. Wilson (Halton), A/C. I. J. Holland (Upper Heyford).

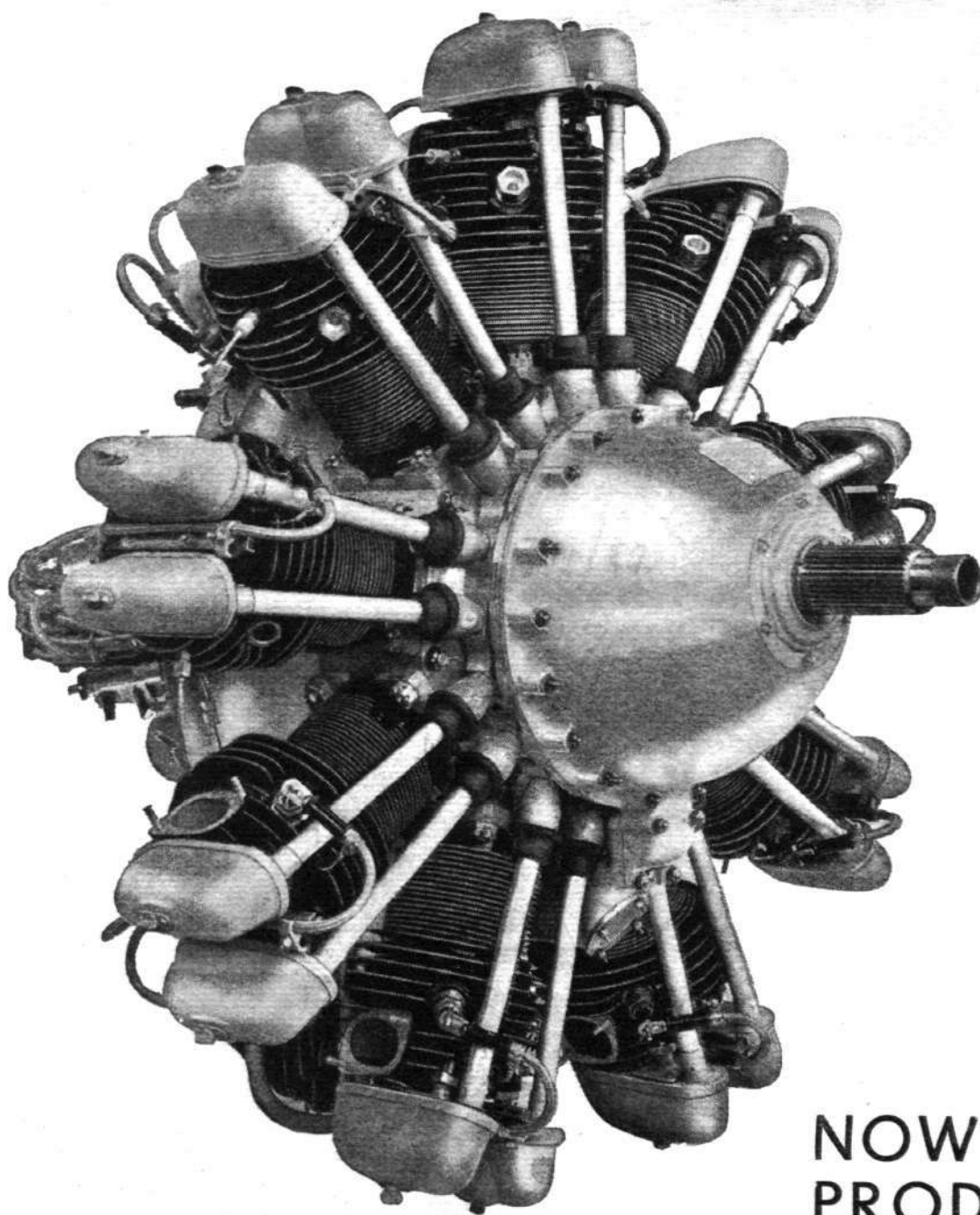


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# THE FOUR WINDS

ITEMS OF INTEREST FROM ALL QUARTERS



**NEW ZEALAND'S ROYAL VISITOR:** The Duke of Gloucester, when he was in New Zealand, made a long flight over some of the famous valleys and lakes in South Island. He is seen here about to embark in the New Zealand Air Force "Puss Moth," which was piloted by Flt. Lt. M. Buckley, at Invercargill Aerodrome.

## Made in China

Shaokwan, a town in Northern Kwantung, which is connected with Canton by the Canton-Hankow Railway, has been selected as the site for the establishment of a new Chinese aircraft factory, where military aeroplanes will be constructed.

## "Some" Speed Range!

A French contemporary, in estimating the performance of the Makhonine "variable wing" monoplane (now equipped with a "Mistral Major"), computes that if a 3,300 h.p. Fiat engine of the type installed in the record-breaking Macchi seaplane were fitted, the maximum speed would be about 404 m.p.h. and the landing speed 68 m.p.h., provided the total weight could be kept within the present figure.

## Twenty-five Years Ago

From *Flight* of February 19, 1910

"As we go to press we have received from the Secretaries of the Aero Club the following copy of the official communication . . . conveying the order of H.M. the King that the Aero Club be henceforth known as the Royal Aero Club of the United Kingdom:—  
Sir,—I am directed by the Secretary of State to inform you that he has had the honour to lay before the King your application of the 10th November last, on behalf of the Aero Club of the United Kingdom, for permission to use the prefix 'Royal' in the name of the Club, and that His Majesty has graciously signified his pleasure that the privilege sought for should be granted, and that the Club be henceforth known as the Royal Aero Club of the United Kingdom . . ."

## Scott Back at School

On Monday of last week Mr. C. W. A. Scott visited his old school, Westminster, and gave a much-appreciated lecture to the Westminster Aeronautical Society and the school.

## A World Flight Completed

Dr. Richard U. Light, who, with Mr. R. Wilson, set out from New Haven, Conn., on August 20 last in a Bellanca seaplane to "see the world," has completed his flight, having arrived back at College Point, N.Y., on January 24. In the course of his 29,000-mile trip he visited Labrador, Greenland, Iceland, Orkney Is., Holland, Denmark, Sweden, Germany, Italy, Greece, Cyprus, Iraq, Persia, India, Siam, Malaya, Java, Borneo, and the Philippines. Thence they took steamship to Vancouver and then proceeded in the Bellanca to Mexico and Cuba, and then up the east coast to New York. During the flight Dr. Light took over 600 photographs with his Fairchild F-8 camera. These he will give to the American Geographical Society.

## Well Tried!

Codos and Rossi left Istres on Saturday last for Buenos Aires on an attempt to beat their own long distance record. They were flying the veteran Blériot monoplane, *Joseph Le Brix*, and their route was via Cape Verde Is. and Rio de Janeiro. Unhappily, when about 500 miles south of the Cape Verde Islands the oil pressure of their Hispano engine was seen to fall and they were forced to turn back. At one time a British steamer was standing by in case the airmen needed help. It was about 5½ hours after they had sent out their first SOS message (they were in constant communication with land throughout) that they landed at Porto Praia in the Cape Verde Islands.

## An Autogiro in Belgium

On Monday Mr. R. A. C. Brie flew an autogiro from London to Brussels for demonstration there.

## A Long-distance Flight

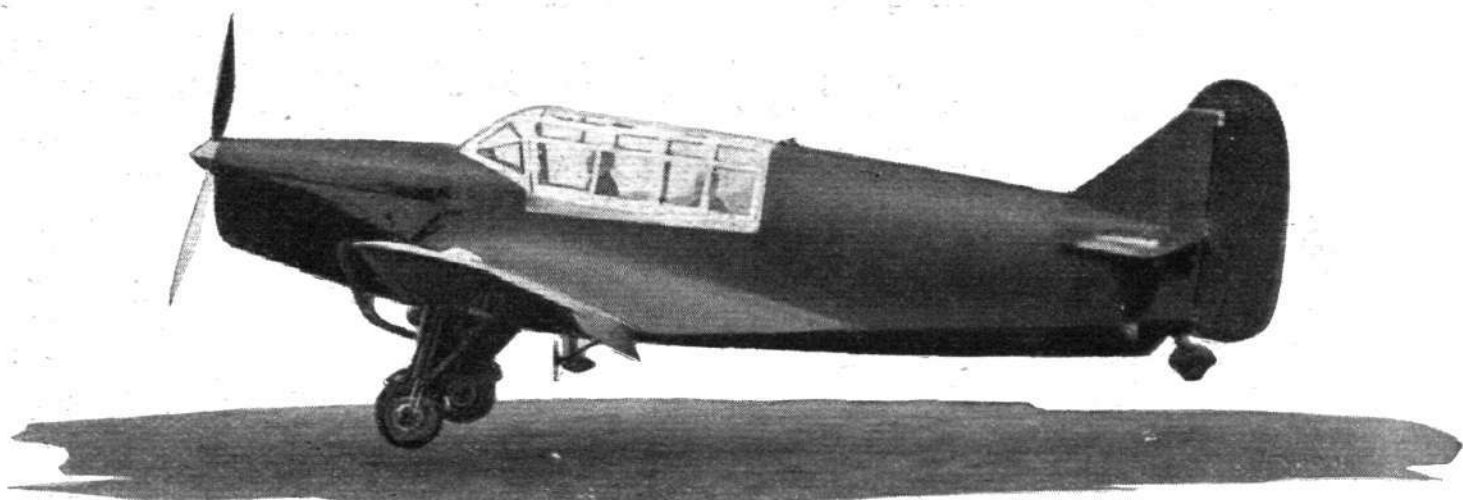
The Hall XP2H-1, described in *Flight* of January 24, recently flew non-stop from Norfolk, Virginia, to Coco Solo, Canal Zone, covering the 2,000 miles in 25 hrs. 15 mins., flying against strong head winds. Eventually, owing to its size, the flying boat will be commissioned as a ship of the U.S. Navy.

## "Scimitars" for Norway

An important contract for the supply of a number of Armstrong Whitworth "Scimitar" single-seater fighters with "Panther" engines has been placed by the Royal Norwegian Air Force. In the course of selection trials several contemporary types of Continental and American aircraft were tried, but finally eliminated in favour of the "Scimitar." Fitted with the 640 h.p. "Panther VII" supercharged engine, the "Scimitar" has a maximum speed of 225 m.p.h. at 13,000 ft.

## A Russian "Blimp"

Two Soviet engineers named Garf and Katanski, of Dirigablestroï (the Dirigible-Building Trust), have worked out a design for a tiny dirigible for use by the Russian aero clubs. It is of the non-rigid type, 700 cubic metres in volume, and the open gondola is designed to carry the pilot and a passenger. It will be fitted with a motor of 30 h.p., and the maximum speed will be 46 m.p.h.; it will carry a supply of fuel sufficient for eight hours, which will enable it to complete a non-stop flight of about 310 miles. It is expected that this small dirigible will be ready to take part in the All-Union Aeronautical Contests to be held in the autumn.



## A FAST TWO-SEATER

*The Latest Hendy "Heck" : Top Speed of 170 m.p.h. : Slots and Flaps Give Noteworthy Low-speed Characteristics*

ENGLISH aeroplane designers have consistently led the world in light machines. For many years they remained true to biplanes, but recently they have turned more toward the monoplane type. This tendency was, perhaps, brought about in the first place by a desire for more speed, but almost coincident with it came the demand for machines which would not only stand knocking about, but which had no wires and struts for the private owner to true-up.

The monoplane form offers a solution of many of these problems; it has thick wings which can be made very rigid so that they can be used for pushing the machine about on the ground; it facilitates the use of a retractile undercarriage, as the thick wing forms a convenient receptacle for the retracted wheels; and it was realised, when monoplanes came into general use, that the proximity of the wing to the ground produced a decided "squashing effect" when landing, attributed by some to compression of air between the wing and the ground, which gave slower and more gentle landings than with the biplane.

There are many advantages claimed for the biplane which, in some designers' eyes, make that type preferable to the monoplane, and the monoplane *versus* biplane controversy depends almost entirely on each designer's idiosyncrasies for its solution in each particular case, but the above are a few of the reasons why so many of our modern light aircraft are now monoplanes.

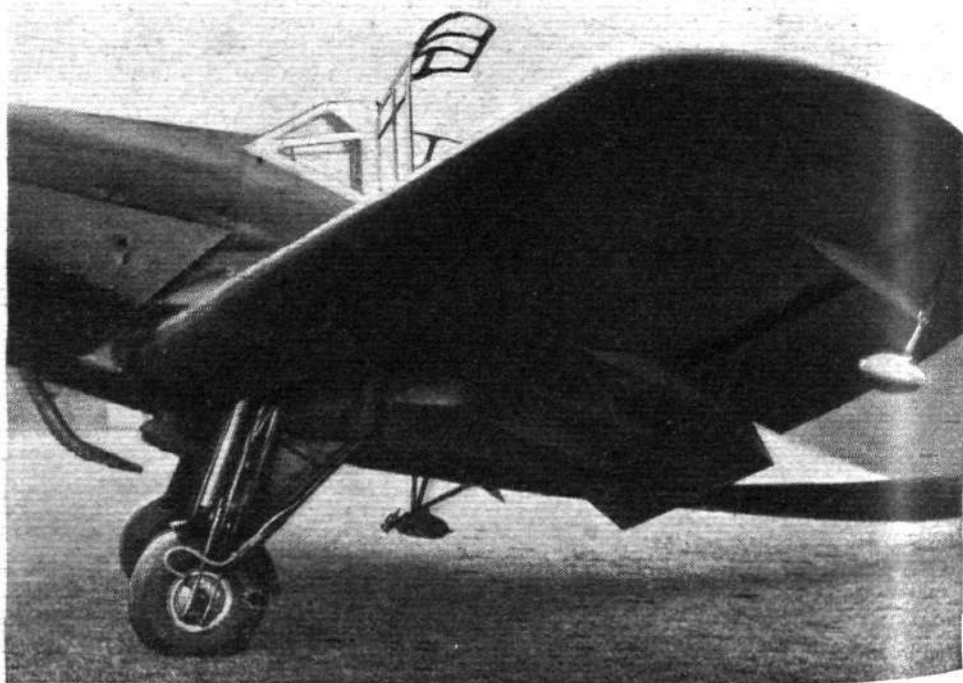
The Hendy "Heck," of which *Flight* gave a preliminary description on July 12, 1934, is a two-seater tandem cabin low-wing monoplane, designed to the order of Mr. Whitney Straight (who is, perhaps, best known for his motor racing successes) by Mr. Basil Henderson, of the Hendy Aircraft Co., Ltd., and built at the Westland Aircraft Works at Yeovil. The machine has a "Gipsy Six" 200 h.p. engine, and with a wing loading as high as 17.5 lb./sq. ft. the speed range in the air is probably greater than has been achieved in any similar machine which has not primarily been built for competition work; that is to say the "Heck" is a rugged machine designed in every way

for hard work, but it has nevertheless a performance which, a few years ago, would have been credited only to machines like those built especially for the International Touring Competition and which were, in so many cases, of little use for practical work.

A top speed of about 170 m.p.h. is at present attainable, but when arrangements have been made with the engine manufacturer which will allow the electric generator and the venturi tubes of the navigating instruments being placed inside, out of the slipstream, Mr. Henderson confidently expects that he will obtain several more m.p.h. This speed has been achieved by clean aerodynamic design, involving the use of the Henderson retractile undercarriage, which was described in last week's issue, and a heavily tapered wing of small area and drag.

The bottom end of the speed range is, perhaps, almost more interesting, the stalling speed being as low as 40 m.p.h., while a two-mile speed course has been flown over in each direction without loss of height at 44.8 m.p.h.

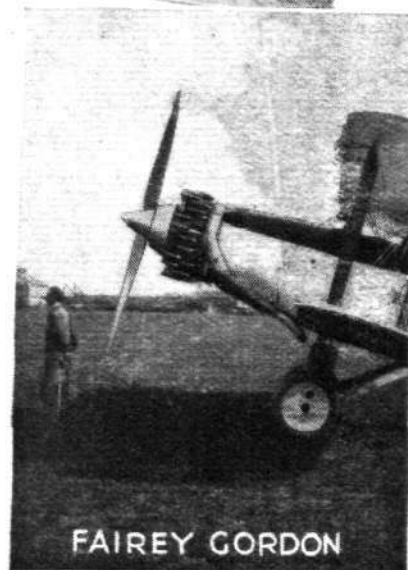
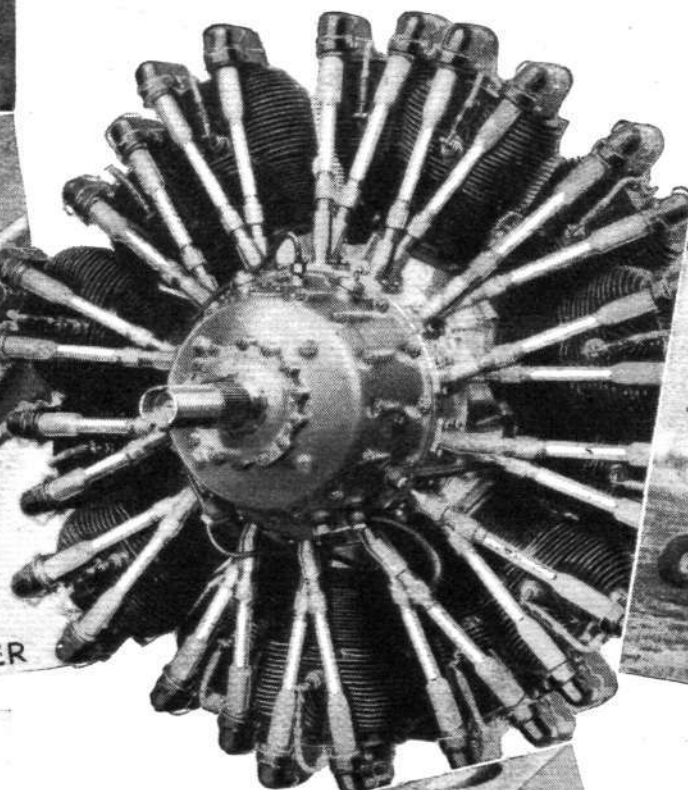
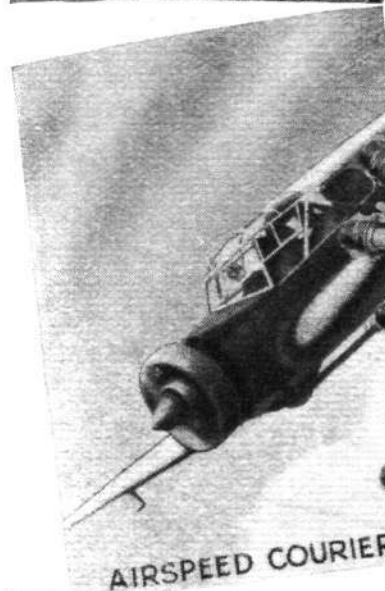
These low figures are largely attributable to the use of slotted flaps and automatic leading-edge slots of the Handley Page type. The flaps, forming the inner portion of the trailing edge of each wing, can be depressed 40 deg. from the



The underside of one wing, showing the flaps in the "down" position, the aileron mass balance, and the recess into which the undercarriage is retracted. (*Flight* photograph.)



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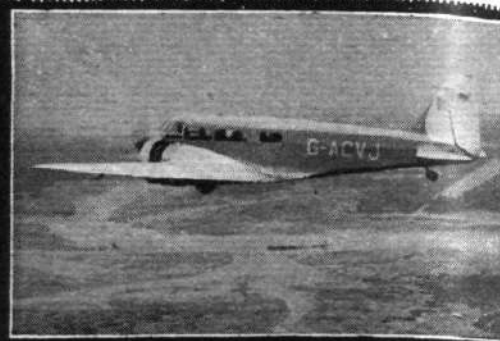
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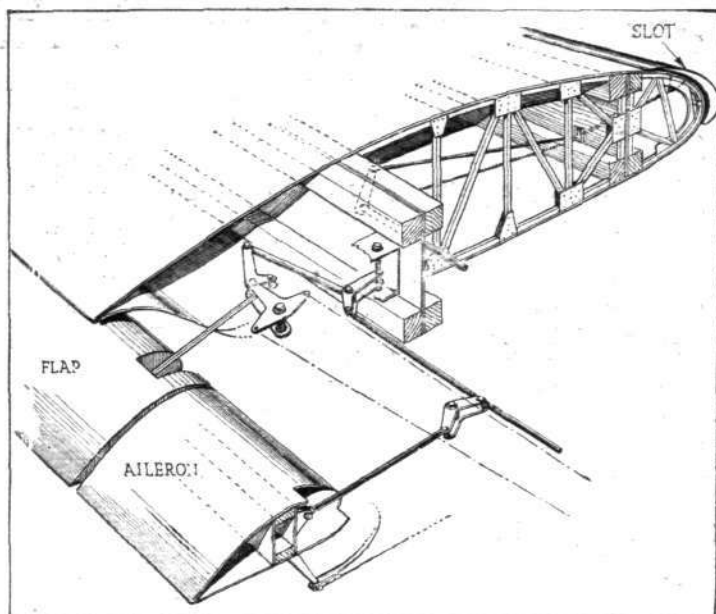


The tapered plan form of the wing can be seen in this view of the "Heck" in the air. (*Flight* photograph.)

normal, and the last part of their travel also lowers the mid position of the aileron movement by some 15 deg., so that, in effect, the whole of the trailing edge is then acting as flap surface.

A short trial in the air enhanced, if anything, the designer's claims as to stability at low speeds and retention of full control on all axes, even when fully stalled and descending at about 11 ft. per second—a figure so low that it opens up possibilities for fully stalled "parachute" landings. The outlook in the air is excellent. The ruggedness of the construction and excellent workmanship throughout give a high degree of confidence—confidence which is certainly necessary in a machine which is capable, as is the "Heck," of being dived at 260 m.p.h.

The pilot's cockpit is well laid out, although the considerable slope of the glass-covered roof necessitates a position



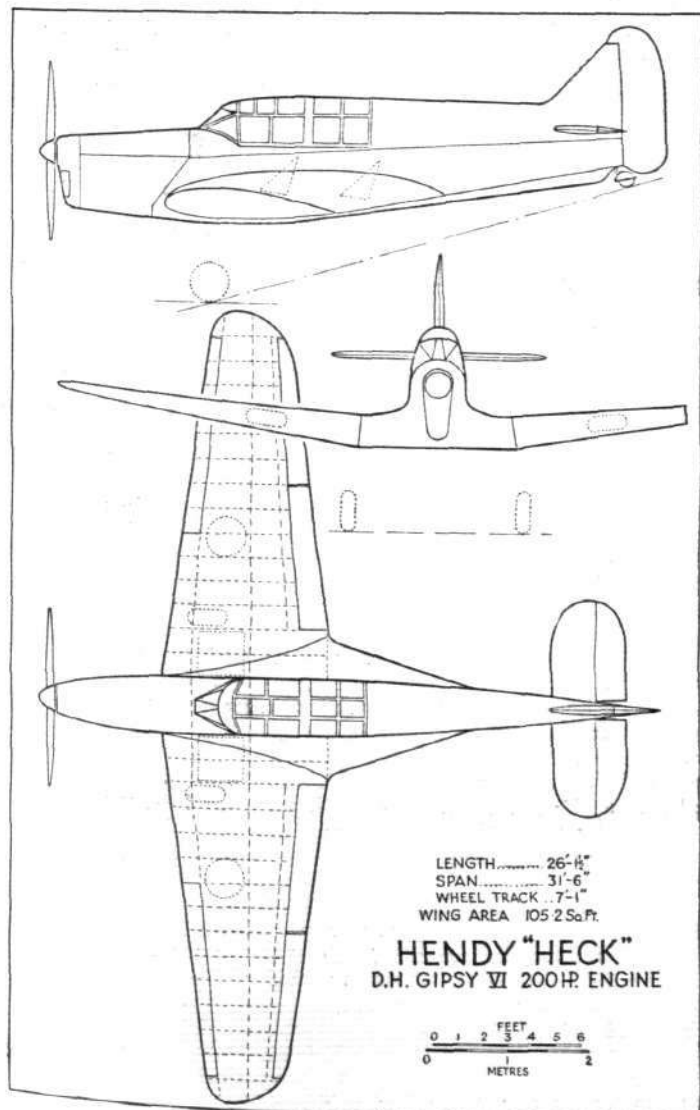
This sketch shows the action of the slotted flaps.

somewhat too far away from the dashboard to satisfy all tastes; however, this in no way impairs the outlook.

It should be pointed out that at the time the photographs accompanying this article were taken the machine was only rough-painted, and had not its final colour scheme of black and gold, which has been designed by Mr. McKnight Kauffer, the well-known artist.



The rear half of the left-hand side of the cabin opens as well as the front half. In the rear cockpit is Mr. B. B. Henderson. The flap is shown slightly lowered. (*Flight* photograph.)



### The Pupils' Vote

A CIRCULAR letter to pupils, asking for a vote on the type of machine preferred, has led to the placing of an order by Airwork, Ltd., for a D.H. "Leopard Moth," to be delivered to the school towards the middle of March. It is believed that this will be the first "Leopard" used for regular instruction, and it will be available at the standard rate of £4 4s. per hour.

The majority of pupils of the Airwork School are potential sportsmen pilots and private owners, rather than commercial aspirants. The aircraft equipment has therefore been chosen for the special needs of the amateur, though it is capable of providing all the necessary training for the commercial licence. Between the sporting pilot and the steady-going tennis-court pilot, who uses the Autogiro, comes the average private-owner-to-be. The present purchase has been made to provide him with initial training on the exact class of machine which he will eventually fly, and the enclosed cabin will also simplify dual instruction in navigation.

## HERE AND THERE

### The Loss of the "Macon"

ONCE again disaster has overtaken an airship of the U.S. Navy—this time, fortunately, without serious loss of life. When returning on February 12 from manoeuvres with the fleet the U.S. Navy rigid airship *Macon* got into difficulties a few miles off Point Sur, California. The captain, Lt. Cdr. Herbert Wiley, sent out a somewhat cryptic S O S saying "We have had bad casualty and the ship is falling." Another signal, "Wait," followed immediately after, and then, half an hour later, a third message came through saying, "Will abandon ship soon as we hit water." Lt. Cdr. Wiley gave the *Macon's* position as twenty miles south of Point Sur, ten miles at sea.

Cruisers and coastguard craft were immediately rushed to this position, and eventually all but two of the eighty-three officers and men from the airship were rescued. The only loss of life was Chief Wireless Engineer E. A. Dailey, who was reported to have jumped from the airship when 125 ft. up, and F. Edquiba, a Filipino mess-boy.

The exact cause of the disaster is still uncertain; it appears that there was no question of a storm, although weather conditions were far from ideal, but Lt. Cdr. Wiley stated that a gust of wind struck the airship with astonishing force, and one of the helium gasbags aft was exposed and ripped almost instantly. The stern crumpled up and the airship commenced to fall stern-first. Lt. Cdr. Wiley ordered the crew to stand by, for the purpose of abandoning the ship, when they were 1,000 ft. up, and as the stern hit the water all jumped from the control car into the water. They swam to the rubber lifeboats, which had been prepared by the crew and floated out. The *Macon* sank slowly stern first, the huge framework crumpling in the swell as it sank.

A few days ago unofficial reports appeared to the effect that trouble with the fins had been experienced just prior to the flight, and that further repairs were due to be made on return, but these may merely be rumours, and not in any way founded on fact.

Most of the survivors were picked up by the cruiser *Richmond*, and the rest by the U.S.S. *Cincinnati* and U.S.S. *Concord*.

The *Macon* was launched on April 21, 1933, shortly after the loss of the *Akron*, a sister ship. It was 785 ft. long, 132.9 ft. max. diameter, and 6,500,000 cu. ft. capacity. The gross lift was 410,000 lb., the useful lift 173,000 lb., and the maximum speed 83 m.p.h. Normally it carried a crew of seventy-five, and had a range of about 10,000 miles.

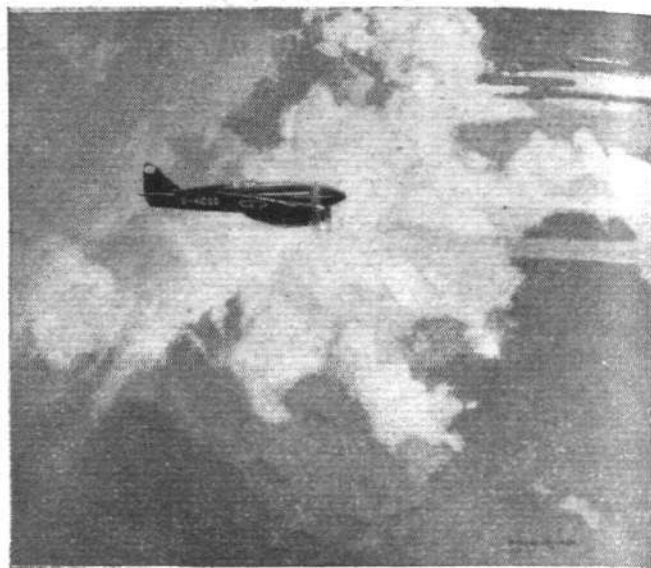
### Internal Airlines Debated by the W.E.S.

The second of the debates arranged by the Women's Engineering Society was more in the nature of a lecture than a debate, and perhaps, for that reason, was not quite so well attended as the first of the series. This was a pity, because these gatherings have something which ordinary lectures lack. It may be that feminine touch which manages to combine comfort and a certain amount of "artisticness" (not artyness!) with subjects like engineering and electricity, or it may be that the audience is different from that which attends the majority of lectures about aeronautical subjects. There is little of that back-scratching which is so prevalent at the lectures of more august bodies, when each and every speaker extols the lecturer and his work until it seems that he is almost too good to live.

The subject of this debate was that of Britain's internal airlines, Mr. William Courtenay being the speaker. He gave his listeners a very good idea of how our airlines have grown up and the position to-day. He asked for the establishment of an aerodrome in North London from which the lines for the Midlands could depart, and suggested that it might be somewhere between Hatfield and Hendon. He also wanted that aerodrome connected with the centre of the City by an underground railway.

Lt. Col. F. C. Sheldermine, the Director-General of Civil Aviation, who was in the chair, thought that an underground railway would be too costly, and that more than one aerodrome would be wanted if congestion were to be avoided. He also felt that a survey of the whole question should be completed at an early date.

[Underground railways are basically wrong for serving aerodromes, because their whole economic structure is built up for dealing only with passengers. Anything which cannot expeditiously handle freight and mails would not provide what is needed for an aerodrome. The Aerodromes Advisory Board



**ART AND THE AIR:** This small reproduction gives some idea of the fine composition and dignity of Norman Wilkinson's painting of the Race-winning "Comet," but it cannot convey the beauty of the colouring. Fine art prints, measuring (without margin) 16½ in. × 20 in., are being offered by the De Havilland Aircraft Co. at £1 1s.; a few artist's proofs are available at £3 3s.

are considering the lines upon which the survey, referred to by Col. Sheldermine, shall be carried out. It is therefore to be hoped that something may be done about it before the end of this year.—ED.]

The next debate of the series will be held in Dorland Hall, Lower Regent Street, London, on February 26, when the subject will be "The flying boat *versus* the airship." Mr. Oswald Short and Sir Dennistoun Burney will be the speakers.

C. N. C.

### MacRobertson—the Last Chapter

The news of the "better late than never" arrival at Darwin recently of R. Parer and G. Hemsworth in their Fairey "Fox," after various mechanical and other troubles, closes the last chapter of the Melbourne Race. Parer and Hemsworth are going on to Melbourne, and, it is said, the "Fox" will then be flown to New Guinea, for use by a mining company.

A short time ago Philips and Powis (Aircraft), Ltd., of Reading, received a most entertaining account of the adventures of Sqn. Ldr. M. C. McGregor and H. C. ("Johnny") Walker, who, with their Miles "Hawk Major," gained fifth place in the handicap, with an average speed of 105 m.p.h. Here are some extracts from their letter:—

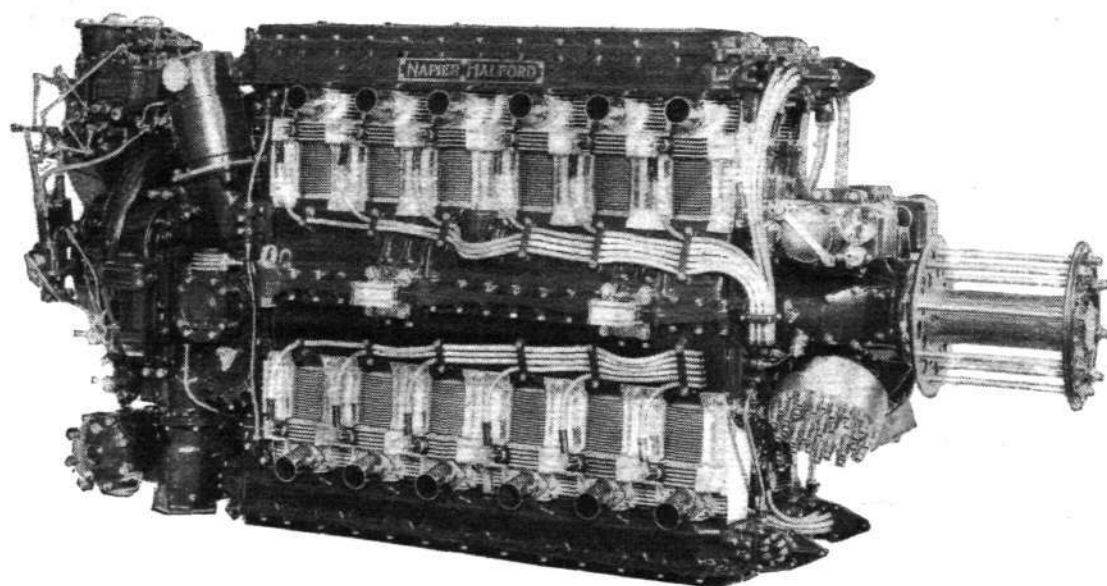
"At the various aerodromes at which we arrived in daylight, we used to do what we later termed the 'Roscoe Turner stunt.' That was to put the nose down some distance away, and, quietly gathering speed, to end up over the aerodrome with the Pitot showing fifty the second time round. One of the officials at Allahabad said: 'Good heavens! What the h— is this you've got? We thought the Comet was fast, but—!'

"It was dark again at Rangoon, and we found wireless masts in the air everywhere at 2,000 feet, but no aerodrome. After dodging these lights, and tearing around the sky for well over half an hour, both firmly of the opinion that we had done too much flying, we came in low down very cautiously from another direction. Some bright lad fired a Verv pistol, and we landed to find that we had struck one night in the year when the natives have a 'carnival of lights.' The wireless masts were lanterns tied to balloons, and not Rugby on a bigger scale!

"The trip to Alor Star was quite peaceful above the clouds, with us both trying to forget that machines with spats were warned not to land there. After re-fuelling, we managed with the help of numerous people to taxi to the end of the field. They pointed out the best runway. It wasn't, and we ended up in a mudhole at forty miles an hour. A number of them pulled us out, bent the spats straight, and this time, after taking the full 800 yards, we scrambled over a mudbank at the other end."



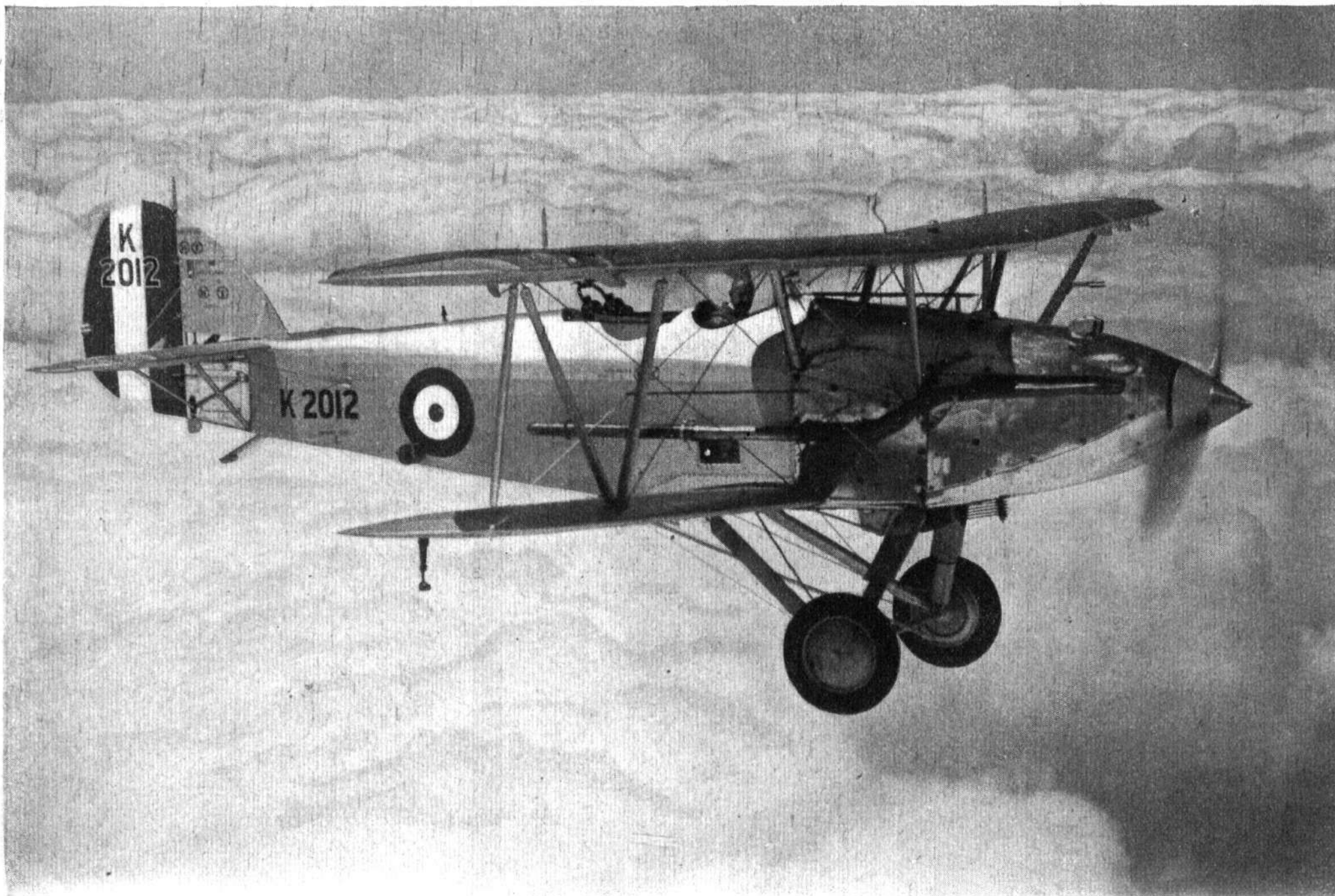
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# FORMATION of ICE on AIRCRAFT:

## CONCLUSIONS from an INVESTIGATION

### *Some Causes and Effects : How Icing-up May be Avoided : Progress in the Development of Protective Devices*

SINCE cloud flying and all-the-year-round air-line operation have become matters of course, the problem of ice formation and its prevention has become one of considerable importance. It represents just one more difficulty which must be overcome before a hundred per cent. regularity and safety can be promised to air travellers. American operators have probably had more experience of this particular problem than any others in the world, and the following is, in the main, a condensed version of an article by Mr. Edward J. Minser, the chief meteorologist of Transcontinental and Western Air, which appeared in the December issue of the U.S. Air Commerce Bulletin.

Two primary conditions must exist in the free air before ice will form on aircraft: (1) Moisture must be present in visible form, and (2) the air temperature must be 34 deg. F. or less. Though formation has been noted at higher recorded temperatures, instrumental error has undoubtedly been a contributory factor; and where frost has formed in clear air it has been due to a cold aircraft entering a warmer air mass of high humidity. In both of these two conditions ice formation has generally been light.

#### Examples of Formation

Ice has been classified in three types: (1) Clear or glaze, (2) rime, and (3) frost.

Clear ice is very tenacious and difficult to break loose, and under not unusual conditions has been known to form at the rate of an inch per minute in the presence of snow. Freezing rain always forms as a clear ice.

Rime is a white opaque ice that forms along leading edges, building out in an irregular sharp-nosed mass. Because of its granular and crystalline structure it is usually easily shaken off. However, at very low temperatures the tenacity of this form of ice increases and the formation, if prolonged, soon reaches dangerous proportions.

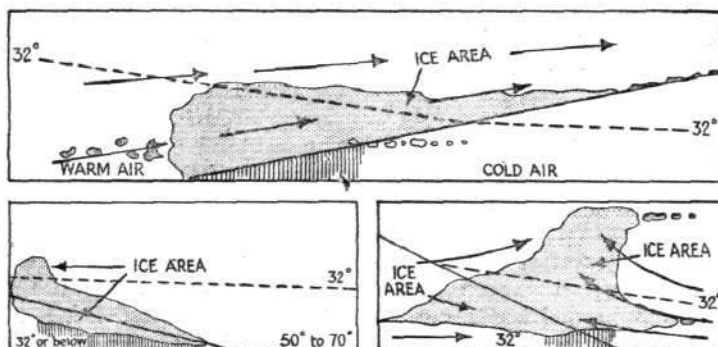
Frost is a light crystalline formation which never assumes any degree of magnitude, the formation generally disappearing as soon as the aircraft reaches the same temperature as the air through which it is flying.

From reports it was noted that clear ice formed in clouds of warm air mass origin, while rime generally occurred in cold air mass clouds. Investigation was directed to determine the underlying cause of this difference.

In order to understand the process of ice formation, condensation of water vapour in the free air must be understood. Cooling of air may be caused by radiation, by contact with cold bodies, by mixing with colder air masses, or by adiabatic cooling due to expansion of the air.

The last is the most effective. It can be accomplished by the following: (1) Turbulence, (2) forced ascent against a mountain barrier, (3) increased friction at the ground, (4) vertical convection, (5) crowding or convergence of stream lines, and (6) lifting of a wide-spread mass of warm air over a colder, denser air mass.

Cloud formations that result in precipitation are



Three typical synoptic ice-forming conditions shown diagrammatically in section. The upper sketch represents a warm front—warm air over cold air—and the lower represents cold fronts. In the case of a warm front icing is only possible at higher altitudes unless the surface temperature is close to freezing point. Rapid convection accompanies cold fronts, and it is often impossible to climb over the ice area.

generally due to one or more of these cooling processes, while radiation, mixing, and contact cooling cause the formation of cold air mass clouds of the stratus types, weak convection forming cumulus or strato-cumulus clouds.

In theory, as soon as water vapour condenses into water the droplets tend to fall. If no air movement existed, either vertical or horizontal, the cloud would slowly dissipate, the droplets either evaporating or reaching the ground. However, the constant convection in any adiabatic cooling process supports these water droplets and carries them to higher levels.

The strength of a vertical current necessary to support cloud droplets of a given size can be calculated. As would be expected, clouds formed by intense vertical convection or rapid lifting along the slope of a colder air mass would have large droplets, while weaker lifting would support only small droplets.

The reason for the large water content in most frontal cloudiness is the high absolute humidity of tropical maritime air which generally forms the warm sector of cyclones. The temperature of this air mass at the surface averages from 50 deg. F. in winter to 70 deg. F. in summer, with transitional warm air masses having somewhat lower temperatures in winter, but higher temperatures in summer. At these temperatures the amount of water available varies from 9 grammes per cubic metre at a temperature of 50 deg. F. to 17 grammes at 70 deg. Since the condensation temperature is high, usually within 10 deg. of the actual temperature, only a slight lifting is necessary to produce condensation. This condensed vapour is carried to higher elevations and lower temperatures and the condensation process continues, the droplets increasing in size until their weight overcomes the resistance of the rising air.

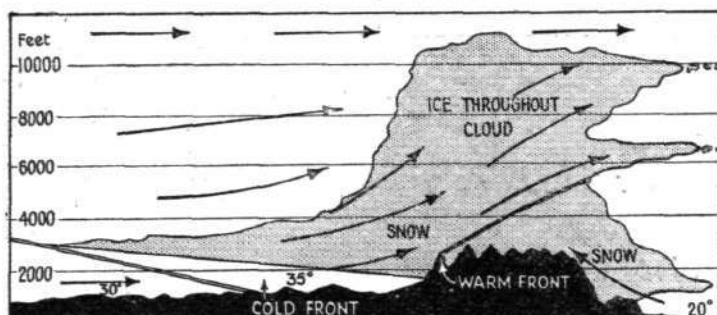
#### A Puzzling Feature

In clouds which form in air with temperatures below freezing point, the water vapour available never exceeds 5 grammes per cubic metre, this amount decreasing rapidly with decrease in temperature. While convection might be strong, this small amount of vapour prevents any water droplets of large size developing, sublimation as snow, rather than rain, generally being caused.

From the analysis of these two processes it is evident that a cloud forming from warm, moist air will be composed of large droplets, densely distributed throughout the cloud, while cold, moist air will result in a cloud of small droplets widely dispersed. Therefore, in flying through a warm air mass cloud considerably more water will be encountered per unit area.

Since ice does not form above a temperature of 34 deg. F., the freezing of condensed water presents the most interesting and also puzzling process of ice formation. The change of the water droplet to ice on collision with an aircraft appears to depend largely upon the evaporation process of lowering the temperature, and this will be explained.

The unit of heat necessary to change the temperature of



The effects of forced convection along mountain barriers, showing the large areas where icing-up is likely to be a serious danger.

a cubic centimetre of water at 1 deg. C. is 1 calorie. To change 1 c.c. of water to vapour at 0 deg. C., 600 calories must be added to the vapour (taken away from the water), and to change 1 c.c. to ice only 80 calories must be removed from the water. Likewise 600 calories are surrendered when 1 c.c. of water is condensed from water vapour, and 80 calories of heat are absorbed in melting 1 c.c. of ice. These two values are respectively known as the latent heat of vaporisation and latent heat of fusion.

Why it is that super-cooled droplets remain in liquid form has never been satisfactorily explained, but since it actually occurs the fact must be accepted. It is known that water can be cooled far below the freezing point and still retain its liquid form, but a slight disturbance will immediately change it to ice. The presence of saline substances in free air droplets tends to lower the freezing point, so apparently the state of such a liquid is simply one of reduced freezing point.

When a droplet which has been super-cooled strikes an aeroplane a portion immediately changes to ice and the temperature of the slush mixture tends to rise to the freezing point, since any mixture of ice and water assumes that temperature. To freeze the remaining water, the heat of fusion is absorbed by means of evaporation and/or absorption by the structure of the machine and/or cooling by the passing air stream.

The rate of evaporation depends upon the difference in vapour pressure in the free air and of the freezing point. If the air temperature is 32.004 deg. F. (0.0074 deg. C.) the vapour pressure over both water and ice is the same, and thus at this point the three states—vapour, liquid, and solid—can exist in equilibrium, and in the presence of liquid water the heat of vaporisation and heat of fusion can be exchanged for one another. At such a temperature, no external exchange of heat being necessary, ice can form almost instantaneously. Since the latent heat of vaporisation is eight times that of fusion, partial evaporation of the liquid will form an eight-fold quantity of ice.

If the air temperature is less than freezing, the difference in vapour pressure permits evaporation even in a saturated volume of air, and when the effect of lowering pressure due to the effect of any aerofoil is considered, evaporation at a rapid rate is readily explicable. The absorption of heat by metal machines is an additional factor, its ultimate transfer to the surrounding air being an effective method of absorbing the heat of fusion. In addition, cloud or fog are seldom of 100 per cent. relative humidity and breaks or masses of air of lower moisture content occur at frequent intervals, the lower vapour pressure accelerating evaporation.

Rapid vertical convection occurs along a cold front due to the lifting effect of the wedge of cold air and along the crest of mountain barriers. In the former case, thunderstorms (cumulo-nimbus) are the identifying cloud type and in the latter, nimbus and heavy cumulus. Intense up-draughts in these clouds sustain large droplets and, therefore, as soon as sub-freezing temperatures are reached heavy icing can occur.

Warm front clouds (of slower formation, due to gradual lifting) also contain large droplets, nimbus, strato-

cumulus and alto-stratus identifying the moist air masses at condensation levels. When these clouds are encountered at sub-freezing temperatures clear ice may be expected, but rime will form if the cloud density is low.

Stratus, cumulus, strato-cumulus, and alto-cumulus, forming in cold air masses, are the result of cooling by radiation, mixing, contact cooling, or weak convection and are, therefore, formed from the moisture in the cold air. Generally the moisture content is very low (less than 5 grammes per cubic metre of air) and, as the cooling is slow, the droplets are small and thinly dispersed through the cloud. In such clouds icing will be of a light rime, unless convection is of the intensity to cause precipitation, in which case a light coat of clear ice will result.

The reason ice forms in two types, clear and crystalline, is apparently due to the rate of freezing. In a cold air mass cloud of small droplets and low density each droplet freezes before another droplet is encountered, forming a granular opaque mass. In a cloud of high moisture content and large droplets the freezing is consequently slower, and as each successive droplet is encountered it spreads out over previous ones, thawing and freezing, resulting in a solid mass of clear ice. It is noted that clear ice often spreads back over the aerofoil of the wing to the trailing edge, where small icicles or beads form, thus indicating a slow rate of freezing.

Since we can expect to find in areas of strong convection the largest cloud droplets and greatest amounts of liquid water, clear ice will occur if the temperature is below 34 deg. F. To avoid dangerous icing it will only be necessary to avoid such areas.

Generally, in winter and over level country (except in thunderstorms of marked intensity) vertical convection diminishes rapidly at levels above 10,000 feet, and, therefore, the size of supported droplets and the cloud density will also diminish rapidly. At these levels, also, the temperature is far below freezing and rime ice will be the general form. Certainly this becomes a far safer flight path.

### Quick Icing

Since a cold aircraft will accelerate ice formation, a climb from a cold air strata through a warmer dense cloud demands caution. On entering such a cloud every droplet encountered will freeze almost instantly and only a few minutes will be necessary to load a 'plane with ice. If the climb is maintained at the maximum permissible rate the inversion above the cloud may be reached before ice has formed to a dangerous degree.

Low, thin stratus, cumulus, and strato-cumulus of cold air mass origin will generally form rime, unless convection is strong, in which case a rapid formation of clear ice is probable. Because of the function of the "triple point" in accelerating ice formation it is best to seek warmer or colder temperatures once ice forms. In the immediate vicinity of freezing point the hazard will be greatest.

The fact that ice will evaporate in clear air at sub-freezing temperatures should always be remembered. When ice has formed it can usually be removed by evaporation in the clear air above or below cloud strata. Snow, in clear air, does not form ice at sub-freezing temperatures.

During the last six years three different methods of prevention have been used: mechanical breakage, dissipation by heat, and the coating, by rubber and/or oil, of affected parts. European countries have made experiments of various kinds, but to America must go the credit for developing the first really effective systems.

In due course heat may be used for the whole work—D.L.H. have made and are making experiments on these lines—but at present mechanical breakage is used to clear the wings and surfaces, heat is used to clear pitot and venturi tubes and coatings are used for airscrew protection.

The Goodrich De-icer, which was first fitted to a Douglas biplane in 1930 and is now being fitted in Europe to Air France's fleet, consists of air pumps, a distributor valve and inflatable tubes, fitted into shoes, which are carried



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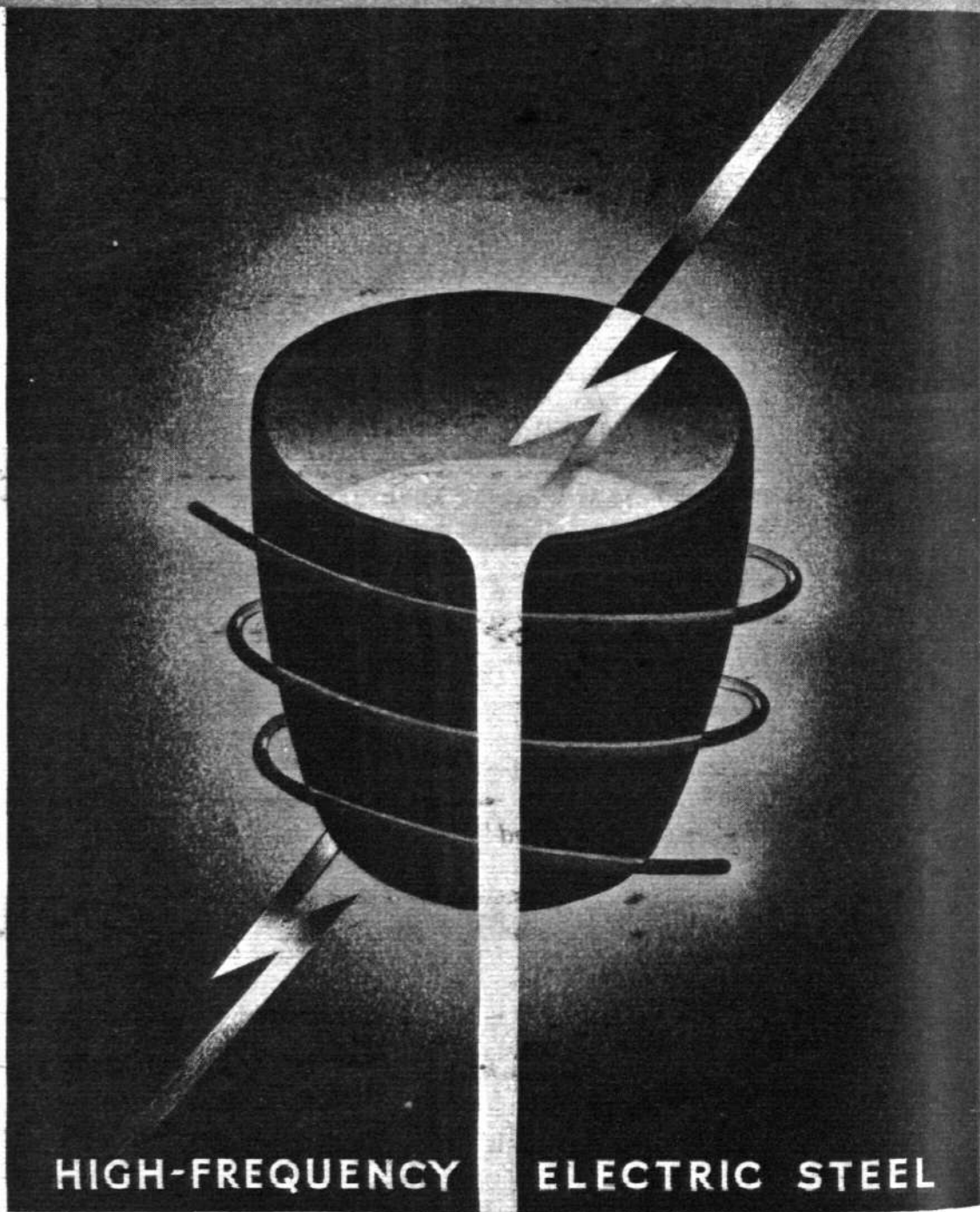
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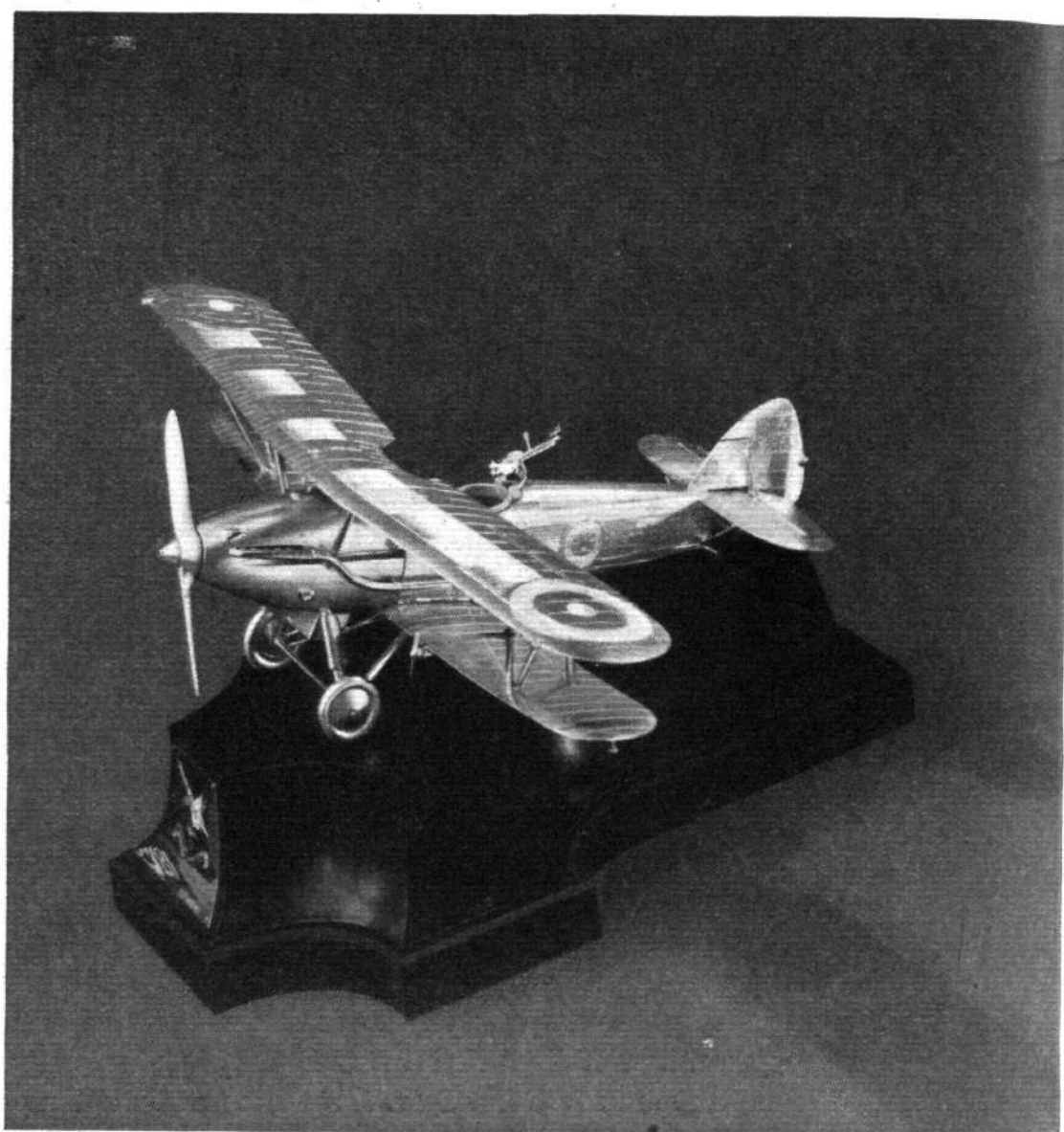
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along the leading edges. From two to four of these tubes, lying parallel, are used in the various affected parts, and the whole equipment weighs between 50 and 80 lb., according to the type of machine. Both T.W.A. and United Air Lines have standardised this equipment for their long-distance routes and the pilots have found that the weight and cost have been amply returned in winter mileage which would otherwise have been cancelled. Similar equipment is now being developed in this country.

The effect of ice formation on airscrew blades and

spinners is hardly less serious. The original remedy of applying a thick oil at every stop has given way to the use of absorbent rubber sheaths, which are also treated with oil.

Electrically heated pitot and venturi tubes are now almost a commonplace on American airline machines, but venturis are now being replaced by engine-driven pumps supplemented by emergency manifold connections. Machines fitted with De-icers now connect their instruments, by regulating valves, to the intake side of the pumps.

## AN INTERESTING CONTROL SYSTEM

*The Operation of the "Swing-over" Column on the "Snark"*

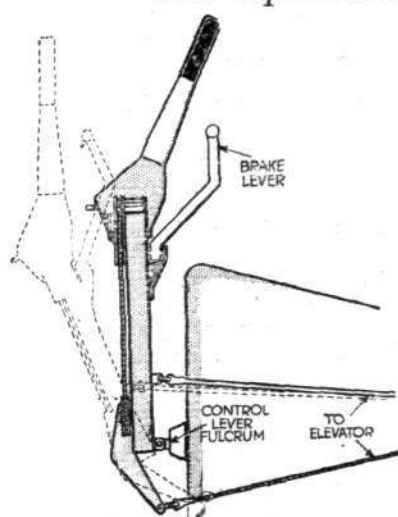


Fig. 1

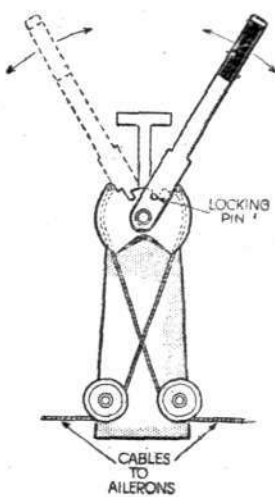


Fig. 2

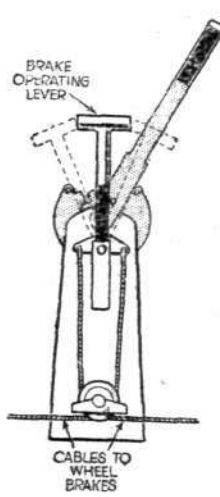


Fig. 3

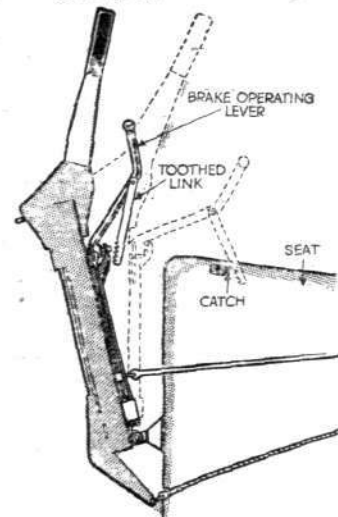


Fig. 4

These sketches, which are purely diagrammatic, indicate the operation of the De Bruyne system; they should be studied in conjunction with the text.

OF unusual interest, the control system developed for the de Bruyne "Snark" deserves detail description. The machine itself was described in *Flight* for December 27, 1934, and February 14 this year. The drawings given above are diagrammatic in that they do not show the actual details of the system, but merely indicate the method by which the results are achieved.

Fig. 1 is a side view of the control column, showing the bottom pivot and the connections to the ailerons. Fig. 2 is a view of the column looking aft; it explains the method whereby aileron control is obtained by hinging the top part of the column only and by arranging for that part to have its neutral position at an angle; i.e., it gives a neutral position on each side, so that either person in the front seats can take control.

brake lever is locked by a catch for holding both wheel brakes "on" when parking the machine; this method has the added attraction that locking locks the elevators up.

The remaining drawing explains the method of operating the ailerons. By altering the length of the link and the relative positions of the centres, any combination of movement can be obtained.

Mr. de Bruyne has primarily built the "Snark" for experimental purposes, so the results he obtains will be followed with the greatest interest. It is understood that his firm, Aero Research, Ltd., is shortly to move to an aerodrome which has been acquired by the company at Duxford, within a mile or so of the Royal Air Force aerodrome of that name.

### THE KERNEL OF "NUT" No. 3

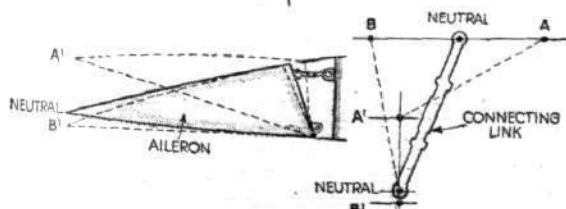
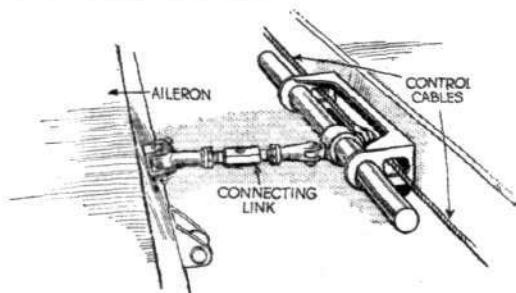
EVERYBODY, so far, appears to have been stumped by Flt. Lt. Comper's third "teaser," which appeared in *Flight* last week (p. 183). He described the unpleasant experience of a pilot whose control column practically "seized" while cornering in a race, and related how, when the machine—which had been relabred just before the race—was examined afterwards, three wing ribs were found to be broken.

The solution was as follows:—

When the fabric was sewn on to the wings the string "stabbing" had caught up the aileron control cables, so that instead of a clear run through the wing the cables were zig-zagging through some of the wing ribs.

For ordinary flying, although the aileron control had felt stiff, such stiffness had been assumed to be normal for a fresh and rather tight system of rigging. It was not until the first steep racing turn was made that the ribs became distorted under the pull of the aileron cables, and then the whole system started to "seize up."

With the pilot's strenuous attempts to save the aeroplane from slipping sideways into the ground on his first heavily banked turn, the most ill-treated ribs packed up under the strain and the aileron cable became free to follow a straight path through the wings, hence the large slack which developed.



The method of operating the ailerons, shown diagrammatically.

Fig. 3 is a similar view looking forward and shows the secondary lever by which the wheel-brakes are applied—differentially by a sideways movement and "both on" by a straight pull backwards. Fig. 4 shows how this

## THE ESHER TROPHY

*Won for the Fifth Time by No. 605 (County of Warwick) (Bomber) Squadron, A.A.F.*

FOR the fifth time No. 605 (County of Warwick) (Bomber) Squadron, A.A.F., has won the Esher Trophy. This trophy is awarded each year to the Auxiliary squadron which attains the greatest proficiency. Marks are given for practically all the functions which a bomber squadron is called upon to perform, such as bomb aiming, air navigation, photography, air gunnery, etc. There is not one examination, but at various times officers from the headquarters of No. 1 Air Defence Group visit the various squadrons and test each one, now in one subject, now in another.

These examinations are really a searching test of the capabilities of a squadron, and there is no doubt that the institution of this competition by Lord Esher has done much to produce the very high standard which all the squadrons have attained. That No. 605 B.S. should have won the trophy five times in the nine years since the competition was first instituted speaks volumes for the keenness and abilities of the men of Birmingham and the County of Warwick. It is also a great tribute to the leadership of the commanding officer, Sqn. Ldr. J. A. C. Wright, A.F.C., T.D., D.L., who has commanded the squadron since its formation.

Last Thursday, February 14, the Esher Trophy was presented to the squadron by Hon. Air. Comdre. Sir Philip Sassoon, Under-Secretary of State for Air. The ceremony took place at 6.30 p.m., and Air Chief Marshal Sir Robert Brooke-Popham, A.O.C.-in-C. Air Defence of Great Britain, had invited a large number of guests to be present. In addition to the Under-Secretary of State and the C.-in-C., there were present on the platform the Lord Mayor of Birmingham, Brig.-Gen. Sir Fairfax Lucy, President of the County of Warwick Territorial Association, Air Comdre. J. E. A. Baldwin, D.S.O., O.B.E., A.O.C. No. 1 Air Defence Group, and other notabilities. Several officers from other A.A.F. squadrons were also among the guests.

On the arrival of Sir Philip Sassoon a very smart guard of honour presented arms. In the front rank alone there were over half a dozen men wearing war medals, and Sir Philip spoke to all these veterans as he inspected the guard.

Sir Fairfax Lucy then addressed the assembly. He said that this was the fifth time that No. 605 B.S. had won the

Esher Trophy under the command of Sqn. Ldr. Wright, and he recalled that in the R.A.F. Display of 1933, while Sqn. Ldr. Wright was leading his squadron at Hendon, his son was piloting one of the large flying boats which flew over as part of the display. He thought that that must be a unique record.

Turning to Sir Philip Sassoon, he said that they all welcomed him as an airman. The country's future was wrapped up in the air, and a country which did not maintain its Air Force was not likely to have any future. He rejoiced at the increase of the R.A.F. which was taking place, and he asked Sir Philip if there were any chance of an increase of the A.A.F. If so, the City of Birmingham could, and would, raise another squadron.

Sir Philip Sassoon made a very happy speech. He said that this squadron was so used to receiving congratulations on winning the trophy that it had become a habit with them. "Alter the rules as we may," he said, "you still go on winning it." On behalf of the Air Council and as Under-Secretary of State for Air, he congratulated them, "but as Honorary Air Commodore of No. 601 Squadron I am filled with hatred and envy." He hoped that it was not true that Sqn. Ldr. Wright would soon be leaving the squadron; if he did everyone would be very sorry. He himself had a great sympathy and admiration for the A.A.F., which was doing very valuable work for the Air Force and inestimable work for the nation. He held out hopes of an increase.

Sir Philip then presented the trophy to Sqn. Ldr. Wright, and then the meeting broke up. The guests were entertained in the officers' mess and the sergeants' mess, and a very jolly time followed.

The following is the record of Esher Trophy winners:—

1926	...	...	No. 601 (County of London) B.S.
1927	...	...	605 (County of Warwick) B.S.
1928	...	...	601 (County of London) B.S.
1929	...	...	602 (City of Glasgow) B.S.
1930	...	...	605 (County of Warwick) B.S.
1931	...	...	605 (County of Warwick) B.S.
1932	...	...	604 (County of Middlesex) B.S.
1933	...	...	605 (County of Warwick) B.S.
1934	...	...	605 (County of Warwick) B.S.

## THE TWO LEAGUES

LAST Saturday the following open letter was sent by Air Comdre. J. A. Chamier, Secretary-General of the Air League of the British Empire, to Lord Rothermere and the Editor of the *Daily Mail*. Copies have also been sent to the 4,000 members of the Air League:—

Gentlemen,—The aspirations of the recently-formed National League of Airmen to create an air-minded nation meet with nothing but welcome from The Air League of the British Empire, which has been striving for the same objective for the past twenty-five years.

It now seems that the original League and your organisation are to travel on parallel courses. Thus, propaganda to create air-mindedness is the common aim of both. Your team of lecturers, when it comes into being, has its forerunner in the lecturers who have been active on our League's behalf for years past. Your suggestion for training young pilots has its earlier and greater counterpart in the £10,000 scholarship scheme which was promoted by us for a like objective, and for which funds have been, and are still being, collected. There are other likenesses in policy and practice which I need not detail.

We regret therefore (1) that you should speak of your newly-formed organisation as "The Air League," as though The Air League of the British Empire did not exist; (2) that by the use of such terms as "hotch-potch of civilians" you should have disparaged the constitution and efforts of other organisations than your own who are engaged in like work; and (3) that you should give the impression that you and your new organisation have a monopoly of anxiety for the safety and progress of our nation in air matters and of the ability to further their advancement.

That both The Air League of the British Empire and your organisation should be working and striving for a

common goal is, to our mind, all for the national good; we both think that there is much leeway to be made up. But that either of us, we or you, should arrogate to ourselves a dictator's rights in air matters seems to us to be out of time and out of tune with the spirit and temper of our nation.

On Monday, Mr. Collin Brooks, chairman of the Advisory Committee of the National League of Airmen, issued a reply, in which he disclaimed any clash of aims between The Air League of the British Empire and the N.L.A. On the contrary, he said, he regarded the two leagues as complementary.

### "Flight" Index and Binding

The index to Volume XXVI of *Flight*, covering the issues from January to December, 1934, is now ready, price 6d., or by post, 7d. With a binding case in blue cloth the price is 4s. 4d. by post. The charge for supplying the case and index and binding the copies is 9s. 6d., plus 1s. for return carriage. Communications should be addressed to the publishers of *Flight*, Dorset House, Stamford Street, London S.E.1.

### Installation of G.A.P.A.N. Master

Capt. the Hon. F. E. Guest, was installed as Master of the Guild of Air Pilots and Air Navigators of the British Empire, at a meeting held at Haberdashers' Hall, London, last Monday.

New members of the Court of the Guild also installed on this occasion were Mr. C. W. A. Scott, Mr. E. W. Percival, and Flt. Lt. H. M. Schofield.

Capt. Guest, in a speech, said that the present was a suitable time for launching an appeal for funds with which to start an insurance scheme for air pilots.





## FLYING COMFORT

*The Miles "Falcon" in Production :  
Features to Appeal to the Private  
Owner : Impressions During a Test*

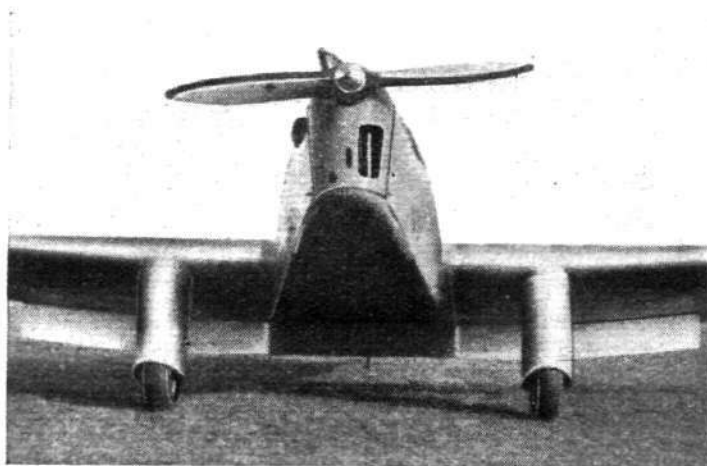
THERE should be a large demand for the Miles "Falcon," which has just gone into production, because it seems to have nearly every desirable feature which private owners will require in an aeroplane of this type: Strength—as with all Mr. Miles' designs, the factors are more than the legal minimum; comfort—plenty of room for four people and ample space for luggage; speed—we found the A.S.I. showing 122-125 m.p.h. at normal r.p.m.; slow landing—with flaps down we touched down "off the clock" and ran only a few yards; stability—hands or feet off, the "Falcon" flew safely.

Taking the flying characteristics in more detail, because *Flight* has already dealt with the structural features (August 23, 1934, and January 10 of this year), a prolonged trial showed that we were justified in thinking that the "Falcon," in its production form, would be even more pleasant to fly than was the "Hawk Major," although when we tried the latter machine it did not seem possible to ask for more. A slight increase in the dihedral of the wings has resulted in more lateral stability, so that the "Falcon" almost flies itself, but it has not, as is so often the case with a machine having this characteristic to a marked extent, lost any of its manoeuvrability. In addition, the "Falcon" is both directionally stable and has its fin surface so nicely proportioned that turns can be made, and the machine flown for all normal purposes, without touching the rudder bar.

### A Good Outlook

The unusual shape of the windscreen enables the pilot to sit well forward, so that he has an excellent outlook when flying, landing or taxi-ing. The outlook when landing is also helped by the nose-down attitude in which the "Falcon" can be glided when the flaps are lowered. Probably there is no machine in which an approach is so easy as in this. The hydraulically operated flaps can be used in exactly the same way as the brakes on a car, and this ability to lengthen or steepen the glide at will proved of inestimable benefit when the engine cuts, as it did last Sunday, and we had to land "from where we were," so to speak. Actually, the possession of these flaps robbed such a proceeding of any excitement, and the incident, which was due to a stuck fuel gauge showing a supply which was non-existent, served only to prove their great value.

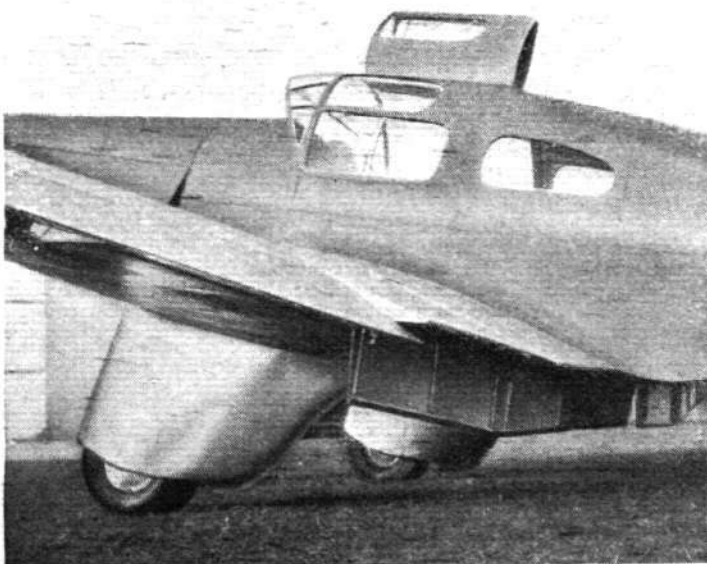
In the air it is delightful to throttle back, lower the flaps with a few strokes of the hydraulic pump handle, and then, with a "waffle" of engine, cruise along at less than 50 m.p.h. Of the other products from Reading, the five-seater with "Gipsy Six" engine, to which we referred last January, is now well ahead, and a "Falcon," also with the larger engine, has been designed.



A view which gives a good idea of the area of the flaps



The clean undercarriage and the new windscreen.



(Right) The flaps seen from behind

# THE ROYAL AIR FORCE

SERVICE NOTES AND NEWS



AIR MINISTRY ANNOUNCEMENTS

## SAUNDERS-ROE BOATS FOR THE R.A.F.

The Air Ministry has decided to place a substantial order for a number of Saunders-Roe R24/31 flying boats (two Bristol "Pegasus" engines). This boat, which has not yet been named, will carry a crew of five. Its range with full load of fuel is over 1,000 miles. The main dimensions are: Span, 80 ft.; length, 57 ft.; height, 20 ft. 3½ in. Further details of performance are not yet released for publication. A photograph of the boat appeared in *Flight* of January 31, on page 128.

## No. 6 FLYING TRAINING SCHOOL, NETHERAVON

No. 6 Flying Training School will form at Netheravon on April 1, 1935. The first course will commence on May 7, 1935. The unit will be placed under the A.O.C., Inland Area, in No. 23 Group, with effect from April 1, 1935. Station Headquarters, Netheravon, will cease to exist with effect from April 14, 1935, on which date the station will come under the Officer Commanding, No. 6 Flying Training School.

## R.A.F. FLYING ACCIDENT

The Air Ministry regrets to announce that F/O. Peter John Pearson Rogers lost his life, and Sub-Lt. Philip Alexander Roby Bremridge, R.N., Flying Officer, Royal Air Force, was injured, as the result of a collision in the air which occurred off Malta on Feb. 12, 1935, between two "Nimrod" aircraft of No. 800 (Fleet Fighter) Squadron.

F/O. Pearson Rogers and Sub-Lt. Bremridge were the pilots and sole occupants of their respective aircraft.

## CRASH OF A "SINGAPORE" FLYING BOAT

A tragic accident occurred last Friday, February 15, about 9.30 a.m., when the Short "Singapore III" flying boat K3595 crashed into Mount Beloritainia, near Messina, in Sicily. All the nine occupants were killed instantaneously. The wreckage subsequently caught fire. The persons on board were:—Flt. Lt. H. L. Beatty, F/O. J. A. C. Forbes, Sgt. H. J. Willis, LA/C. W. P. Wallace, LA/C. R. D. J. Rees, LA/C. C. N. Allen, Cpl. S. T. Bailey, A/C.1 L. Wogan, and Mr. R. J. Penn, of the R.A.E., Farnborough.

The four flying boats which left Pembroke Dock on January 15, in charge of No. 210 (F.B.) Squadron for delivery to No. 205 (F.B.) Squadron at Singapore, had been detained at the island of Nisida, near Naples, first by engine trouble and then by an outbreak of influenza among the crews. On February 15 this boat, accompanied by K. 3592, started from there for Calafra in Malta, which was not in the original itinerary. Clouds covered the mountains round the straits of Messina, and the bad visibility was evidently responsible for the disaster. The bodies have been recovered and, escorted by British and Italian naval personnel, were placed on board H.M.S. *Durban* at Messina, carried to Malta, and buried there.

H.M. the King has sent a message of deep sympathy to the Secretary of State for Air, and other messages have been received from Signor Mussolini, from the French Air Minister, and from other governments.

## OFFICERS AND AIRMEN OF THE JEWISH FAITH

So far as the exigencies of the service permit, leave is to be granted to officers and airmen of the Jewish Faith stationed at home who may desire to observe the undermentioned holy days during the current year:—(i) Feast of the Passover, April 18 to April 25, 1935. (ii) Feast of Pentecost, June 7 and 8, 1935. (iii) New Year, September 28 and 29, 1935. (iv) Day of Atonement, October 7, 1935. (v) Feast of Tabernacles, October 12 and 13, 1935. Leave may also be granted to officers and airmen serving abroad at stations where facilities exist for observing these holy days. The personnel concerned are to be excused duty as from sunset on the previous day. The leave granted under this order will count as part of the ordinary annual leave.

## THE R.A.F. BENEVOLENT FUND

The usual meeting of the Grants Committee was held at Iddesleigh House on Tuesday, February 5. Mr. W. S. Field was in the chair, and the other member of the committee present was Mrs. L. M. K. Pratt Barlow, O.B.E. The committee considered a number of cases and made grants to the amount of £250 17s. The next meeting was fixed for February 21.

## PERMANENT COMMISSIONS AND MEDIUM SERVICE

As a result of the examination held last November, the following twelve short service flying officers have been selected for permanent commissions (General Duties Branch) as specialists. Those marked "E" will attend a specialist course at Henlow, those marked "S" at the Electrical and Wireless School, Cranwell, and those marked "A" at the Air Armament School:—Carpenter, C. N., Bathurst, P., Saw, A. A., Chapman, J. H. A., Houlbrook, W. L., Gibson, D. A., and Horner, H. V., "E"; Slee, L. C., and Bull, W. J. F., "A"; McMullen, C. C., Cardale, J. G., and Ross, Q. W. A., "S".

The following S.S. flying officers have been selected for non-specialist permanent commissions (General Duties Branch):—Dixon-Wright, F. W., Ferguson, K. F., Goodhart, J., Hickey, W. J., Lockett, C. E. S., Manton, G. A. L., Ryan, R. S., and Springall, E. A.

The following S.S. flying officers have been selected for Medium Service:—Bertlett, G. A., Brougham, R. K., Burgess, J. W., Calder, M. F., Cameron, W. E., Carey, A. M., Chambers, T. C., Cox, W. R., Denholm, G. H., Donaldson, E. M., Donaldson, J. W., Dwyer, M. H., Finny, A. W. M., Gardner, F. S., Grace, A. D., Graham, H. R., Grandy, J., Hare, M., Harvey, W. P., Hicks, A. J., Hobbs, R. H., Hunnard, J. W. A., Hunter, P. A., Judge, J. W. B., Keane, S., Lang, T. F. U., Lovell-Gregg, T. G., McKern, R. N., Martin, A. C., Miller, J. D., Moseley, S. M., Nicholi, B. S., Ramsden, J., Reid, D. W., Ross, P. S. H., Shepard, S. E. R., Shute, F. W. C., Sisson, J. C., Sloan, D., Sorel-Cameron, R., Stephens, J. F., Stewart, A. G. F., Sutton, J. J. A., Talbot, J. R., Taylor, L. F. J., Warfield, J. M., Willis, J. O., Wills, A. P. S., Wood, G. F., and Woodhouse, G. P.

## TRANSFER OF OFFICERS TO THE RESERVE

The undermentioned short service, medium service and non-permanent officers should note that they become due on the dates stated for transfer to the reserve, or for relinquishment of commission. Those marked \* have been provisionally selected for permanent commissions, and those marked † are not liable for Reserve service.

### General Duties Branch

*Flight Lieutenants:*—\*George Frederick Alexander, \*Ronald Pearl Cauthery, \*Herbert Lindsell Messiter, and \*John Towers Mynors, August; Leslie Clement Barling, Arthur Meuric Nairne David, William Frank Lovering, John St. Clair Arbuthnott, Gordon Lennox George Richmond, Raymond Eglington Hall, and Douglas John Harrison, September. *Flying Officers:*—\*Maurice Quartano Chandler, \*Bernard Nelson Matson, \*William Forster Pharaizyn, †Donald Clifford Tyndall Bennett, †Normand Berry Littlejohn, and Horace James Leatham Hawkins, August; John Reginald Shelton Agar, Herbert Langdale Andrews, \*Gordon Richard Brice, Thomas Harold Burleigh, Frank Crump, Peter Fidelis Foss, Montgomery Vincent Gibbon, Henry Lawrence Matthews Glover, Peter Heylin Heygate, Peter Warren Johnson, and \*John Andrews Tester, September.

### Medical Branch

Flt. Lt. Robert Keith Muir, M.D., C.M., August.

### Dental Branch

*Flight Lieutenants:*—Harold Keggin, L.D.S., Victor Harry Wells, L.D.S., and Brendan Leo Harrington, B.D.S., August.

### Chaplains Branch

†The Revd. Charles Percy Nott Rowband, M.A., September.

## LONG SERVICE AND GOOD CONDUCT MEDALS

The Long Service and Good Conduct Medal has been awarded to the following airmen:—W.O. Walker, E. W., W.O.2's Beckett, H. W., Bosisto, C. E. D., Callender, A., Hullcoop, H. J., and Tomlinson, W., Flt. Sgts. Bowick, H., D.F.M., Bristow, A., Cairns, P. J., Clare, T., Fox, R. S., Freeth, H., Hill, C. H., Holmes, T., Kerr, A. S., Kirby, F. C. H., Knight, R. P. G., Lainsion, L. H., Millson, C. H., Power, T. C., Rudland, G., and Saunders, R., Sgts. Beard, C. V., Coomber, H. W., Croucher, B. L., Davey, W. J., Driver, W. G., Eggar, A., Endersby, G. E., Hawkins, W., M.M. (now deceased), Hollobon, W. S., Pogson, R. A., Samuels, T. G., Seaton, S., and Smith, E. H., Cpls. Brown, W., and Dykes, W. H., Cpl./A./Sgts. Fenn, D., and Havill, F. T., Cpls. Holl, C. G. E., Mitchell, H., Mulford, R., and Park, D. C., Cpl.-A./Sgt. Penfold, T. O., Cpls. Ross, J. H., and Simpson, T., Lce./A./Sgt. Girtley, T., Lce./A./Cpl. McCutcheon, R., A.C.1 Acott, W. A., A.C.2 Bevan, R. B.



# +WESTLAND+

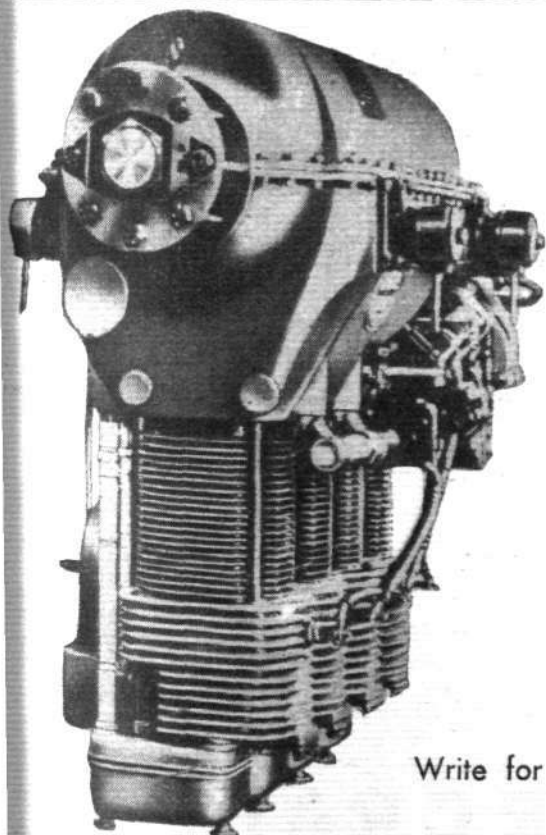
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## COMRADES OF THE ROYAL AIR FORCES

It is proposed to hold a reunion dinner for all ranks, both past and present, of H.M. Air Forces, and their wives and lady friends, on March 2 next, at the Temple Bar Restaurant, Strand, London, W.C.2, at 7 for 7.30 p.m. Lounge suits will be worn. The chair will be taken by Admiral Mark Kerr, C.B., M.V.O., and he will be supported by Air Comdre. B. C. H. Drew, C.M.G., C.B.E., and Group Capt. R. Leckie, D.S.O., D.S.C., D.F.C.

Tickets at 4s. 6d. each, and full information, may be obtained from Mr. E. W. Phillips, R.A.F. Station, Hendon, N.W.9.

## ROYAL AIR FORCE GAZETTE

London Gazette, February 12, 1935

## General Duties Branch

The following Flying Officers are promoted to the rank of Flight Lieutenant (Jan. 27):—G. W. Lane, G. G. Barrett, R. C. Keary, K. W. Niblett, K. P. Lewis, L. Crocker, F. R. Drew, W. T. F. Wightman, W. I. H. Burke, C. A. Watt.

P/O. L. W. Burgess is promoted to the rank of Flying Officer with effect from Sept. 20, 1933, and with seny. of March 20, 1933. P/O. W. S. Jenkins is promoted to the rank of Flying Officer (Oct. 10, 1934). Air Marshal Sir E. R. Ludlow-Hewitt, K.C.B., C.M.G., D.S.O., M.C., is placed on the half-pay list, scale A (Feb. 9). Flt. Lt. C. J. Collingwood, D.F.C., is restored to full pay from half-pay (Jan. 23). Lt. R. E. Gunston, R.N., Flying Officer R.A.F., ceases to be attached to the R.A.F. on return to Naval duty (Jan. 31). F/O. (Hon. Flt. Lt.) D. C. J. Miller (Capt. 17/21st Lancers) ceases to be seconded to the R.A.F. on return to Army duty (Jan. 13).

## Stores Branch

P/O. on probation W. MacI. King is confirmed in rank and promoted to the rank of Flying Officer (Jan. 4). F/O. A. E. Haes is promoted to the rank of Flight Lieutenant (Jan. 10).

## Memorandum

The permission granted to Lt. J. M. Carroll to retain his rank is withdrawn on his conviction by the civil power (Oct. 2, 1934).

## ROYAL AIR FORCE RESERVE

## Reserve of Air Force Officers

## General Duties Branch

Flt. Lt. H. Thomas is transferred from class A to class C (Jan. 3). Flt. Lt. T. A. Thornton relinquishes his commission on completion

## AERO ENGINE—TIGER IV

A new engine of the 14-cylinder double row radial type has been introduced into the service. The official name of the engine is Tiger IV. The engine has a 5½ in. bore and 6 in. stroke, the power rating being 670/700 B.H.P. at 2,150 r.p.m. at 5,000 ft. altitude, on fuel to specification D.T.D. 224.

## R.A.F. SWIMMING ASSOCIATION

Flt. Lt. R. D. McE. Hart has been appointed Hon. Secretary of the R.A.F. Swimming Association, with effect from January 28, 1935. His address is:—Royal Air Force, Halton Camp, Aylesbury, Bucks.

of service and is permitted to retain his rank (Jan. 10). P/O. on probation J. L. Rogers relinquishes his commission on appointment to a commission in the Royal Indian Navy (Jan. 11). F/O. Sir A. P. Hope, Bt., relinquishes his commission on appointment to a commission in the Auxiliary Air Force (Jan. 25). F/O. C. McL. Reid relinquishes his commission on completion of service and is permitted to retain his rank (Nov. 1, 1934) (substituted for notification in the Gazette of Jan. 15).

## AUXILIARY AIR FORCE

## General Duties Branch

No. 601 (COUNTY OF LONDON) (FIGHTER) SQUADRON.—Sir A. P. Hope, Bt., is granted a commission as Pilot Officer (Jan. 25). F/O. A. C. M. Jackaman resigns his commission (Nov. 10, 1934).

## Stores Branch

No. 607 (COUNTY OF DURHAM) (BOMBER) SQUADRON.—M. R. Preece (Flying Officer, R.A.F.) (Retd.) is granted a commission as Flying Officer whilst serving as a Civilian Stores Officer with the Auxiliary Air Force (Jan. 31).

## Accountant Branch

No. 603 (CITY OF EDINBURGH) (BOMBER) SQUADRON.—T. C. Garden is granted a commission as Pilot Officer (Jan. 13).

## TERRITORIAL ARMY

London Gazette, February 15

## ROYAL ENGINEERS

## ANTI-AIRCRAFT SEARCHLIGHT COMPANIES

ESSEX GROUP.—J. R. G. Baird (late Cadet, Eton Coll. Contgt., Jun. Div., O.T.C.) to be Sec. Lt. (Feb. 16).

## ROYAL AIR FORCE INTELLIGENCE

**Appointments.**—The following appointments in the Royal Air Force are notified:—

## General Duties Branch

**Wing Commanders.**—K. M. St. C. G. Leask, M.C., to Headquarters, Air Defence of Great Britain, Uxbridge, 3.2.35; for Equipment (Engineer) Staff duties vice Wing Cdr. H. H. MacL. Fraser. S. P. Simpson, M.C., to Administrative Wing, Halton, 10.2.35; for Administrative duties vice Sqn. Ldr. R. S. Sugden, A.F.C. F. W. Stent, M.C., to Headquarters, Inland Area, Stanmore, 11.2.35; for Equipment (Engineer) Staff duties vice Wing Cdr. H. G. Smart, O.B.E., D.F.C., A.F.C.

**Squadron Leaders.**—E. R. Openshaw, A.F.C., to Headquarters, R.A.F., Middle East, Cairo, 1.2.35; for Armament duties vice Sqn. Ldr. R. St. H. Clarke, A.F.C. A. L. Paxton, D.F.C., to Headquarters, R.A.F., Iraq, Hinaidi, 1.2.35; for Air Staff (Training) duties vice Sqn. Ldr. H. T. Lydford, A.F.C. G. A. H. Pidcock, to Air Armament School, Eastchurch, 21.1.35; for Armament duties. H. H. Down, A.F.C., to Central Flying School, Wittering, 4.2.35; for flying (Chief Flying Instructor) duties vice Sqn. Ldr. R. Harrison, D.F.C. R. J. Rodwell, to No. 207 (B) Squadron, Bircham Newton, 6.2.35; to command vice Wing Cdr. P. E. Maitland, A.F.C.

**Flight Lieutenants.**—J. A. Elliot, to No. 1 Air Defence Group Headquarters, 1.2.35. J. W. F. Merer, to D.T.D., Dept. of A.M.R.D., Air Ministry, 1.2.35. H. G. Sawyer, A.F.C., to D.T.D., Dept. of A.M.R.D., Air Ministry, 1.2.35. R. B. Sutherland, D.F.C., to Central Flying School, Wittering, 1.2.35. E. B. Addison, to No. 36 (I.B.) Squadron, Singapore, 2.2.35. A. G. Adnams, to No. 208 (Army Co-operation) Squadron, Heliopolis, Egypt, 1.2.35. H. I. Cozens, to No. 203 (F.B.) Squadron, Basrah, Iraq, 1.2.35. J. A. McDonald, to No. 55 (B) Squadron, Hinaidi, Iraq, 1.2.35. F. E. Nuttall, to No. 84 (B) Squadron, Shaibah, Iraq, 1.2.35. F. Porter, to Station Headquarters, Amman, Transjordan, 1.2.35. C. W. L. Trusk, A.F.C., to Station Headquarters, Ramleh, Palestine, 1.2.35. H. Waring, to R.A.F. Base, Singapore, 2.2.35. T. W. S. Brown, to Home Aircraft Depot, Henlow, 4.2.35. J. B. Fyfe, D.F.C., to Experimental Section, Royal Aircraft Establishment, Farnborough, 6.2.35. W. R. Monro-Higgs, to No. 1 (F) Squadron, Tangmere, 4.2.35. S. L. Blunt, to Station Flight, Duxford, 5.2.35. G. P. Charles, to Royal Air Force College, Cranwell, 4.2.35. R. H. S. Spaight, to R.A.F. Base, Gosport, 1.2.35. G. C. Stemp, to Aircraft Park, India, Lahore, 11.1.35. C. N. H. Bilney, to No. 40 (B) Squadron, Abingdon, 5.2.35. J. D. S. Denholm, to Air Armament School, Eastchurch, 29.1.35. C. Ryley, to Record Office, Ruislip, 11.2.35.

**Flying Officers.**—H. Ford, to Aircraft Depot, Iraq, Hinaidi, 1.2.35. A. O. Molesworth, to Air Armament School, Eastchurch, 7.2.35. A.

Moncrieff, to Aircraft Park, India, Lahore, 16.1.35. J. H. A. Chapman, to Air Armament School, Eastchurch, 11.2.35.

**Pilot Officers.**—A. Green, to No. 1 Armoured Car Company, Hinaidi, Iraq, 1.2.35. C. F. Newcome, to No. 2 Armoured Car Company, Ramleh, Palestine, 1.2.35. T. C. Sanders, to No. 2 Armoured Car Company, Ramleh, Palestine, 1.2.35. G. Thripp, to No. 47 (B) Squadron, Khartoum, Egypt, 1.2.35.

**Acting Pilot Officers.**—The following Acting Pilot Officers are Posted to No. 4 Flying Training School, Abu Sueir, Egypt, on 1.2.35:—H. L. I. Brown, H. D. Cooke, D. Davies, R. T. F. Gates, W. I. Hammond, J. E. Jacobs, J. C. McG. Lunn, R. E. X. Mack, R. B. Nuthall, G. Packe, V. A. Pope, W. Townson, R. C. Waddell, W. Foulsham, to No. 2 Armoured Car Company, Ramleh, Palestine, 1.2.35.

## Stores Branch

**Wing Commanders.**—F. E. J. Coates, to Aircraft Depot, Iraq, Hinaidi, 1.2.35; for Stores duties vice Wing Cdr. W. B. Cushion, O.B.E. G. Stevens, O.B.E., to Headquarters, R.A.F., Iraq, Hinaidi, 1.2.35; for Equipment (Supplies) Staff duties vice Wing Cdr. R. W. Thomas, O.B.E.

**Flight Lieutenants.**—M. E. O'B. Atkinson, to No. 30 (B) Squadron, Mosul, Iraq, 1.2.35. E. C. Farman, to Headquarters, R.A.F., Middle East, Cairo, 1.2.35. F. W. Felgate, to Aircraft Depot, Iraq, Hinaidi, 1.2.35.

**Flying Officers.**—H. E. Bethell, to Aircraft Depot, Iraq, Hinaidi, 1.2.35. B. S. Cartmel, to R.A.F. Depot, Middle East, Aboukir, 1.2.35. I. Lloyd, to Aircraft Depot, Iraq, Hinaidi, 1.2.35.

## Accountant Branch

**Squadron Leaders.**—A. E. Vautier, to No. 4 Flying Training School, Abu Sueir, Egypt, 1.2.35; for Accountant duties vice Sqn. Ldr. A. Holmes. R. Whyte, to Station Headquarters, Hinaidi, Iraq, 1.2.35; for Accountant duties vice Wing Cdr. P. J. Wiseman.

**Flight Lieutenants.**—J. H. S. Richards, to Station Headquarters, Hornchurch, 1.2.35. V. G. A. Bennett, to D. of E., Dept. of A.M.S.O., Air Ministry, 1.2.35.

## Medical Branch

**Flying Officers.**—A. W. Callaghan, to R.A.F. General Hospital, Hinaidi, Iraq, 1.2.35. I. Mackay, to R.A.F. General Hospital, Hinaidi, Iraq, 1.2.35.

## Dental Branch

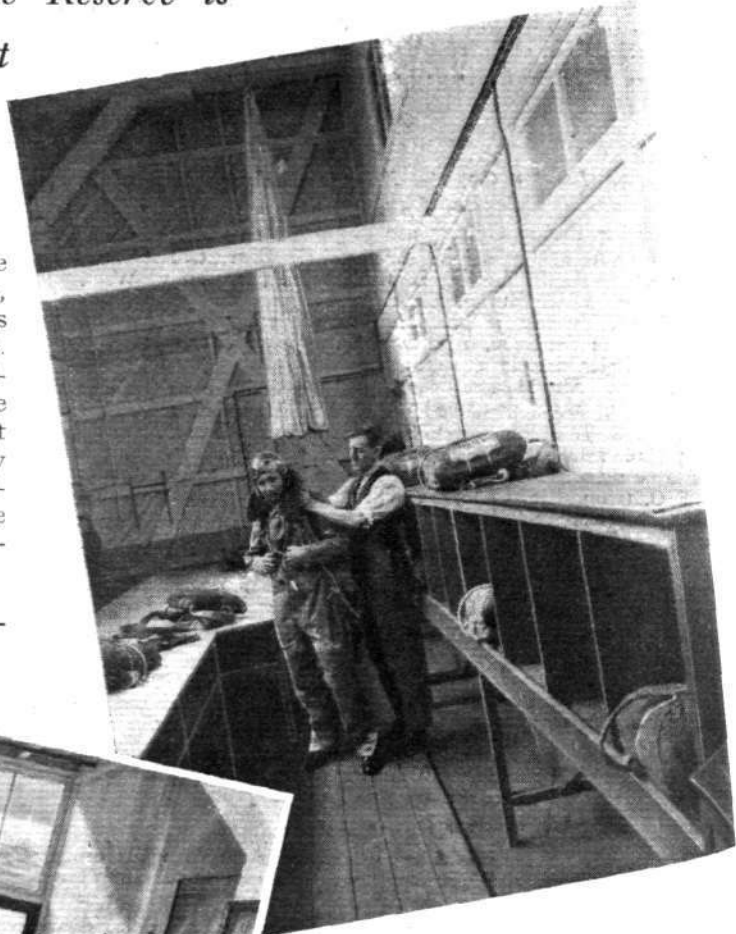
**Squadron Leader.**—G. A. Ballantyne, to R.A.F. General Hospital, Hinaidi, Iraq, 1.2.35; for duty as Senior Dental Officer.

# THE STORY of a PIONEER SCHOOL

*How Training for the Royal Air Force Reserve is  
Carried Out at the Bristol Establishment*

THOSE who were associated with aviation in the early days will recall that as far back as 1910 a flying school was established by the Bristol Company, or, as it was then, the British and Colonial Aeroplane Company. The school was soon engaged in the instruction of a rapidly increasing number of military, naval and civilian pupils who were fired with what was then a somewhat heroic enthusiasm to qualify as pilots.

During 1911 the Bristol school attained an eminent position in the aeronautical world, and, in addition to the aerodrome at Filton, a flying school was established at Amesbury, in the centre of the military area on Salisbury Plain, and later a further school was opened at Brooklands. Pupils, not only civilians and members of the British Forces, but also many from foreign countries, re-



(Right) In the parachute room.



Pupils studying armament.

(Right) In the main lecture room.

ceived instruction and obtained their pilots' tickets. Often the cosmopolitan nature of the pupils and the variety of tongues were such that a better practical ethnographical exposition could hardly have been provided.

It is not without interest to mention here that the company's activities in this direction were of great value to the country when the Great War shattered the peace of Europe; without the personnel which had received instruction at the Bristol school in the preceding years Great Britain would undoubtedly have entered into hostilities in the air under a severe handicap. Among the 336 pupils who had obtained instruction from the company previous to their enrolment by the War Department in 1914 were included no fewer than 253 officers, as compared with 255 Army and Navy officers who had received training at all other flying schools combined.

To-day, twenty-four years after its inception, the Bristol flying school still retains its fame as an instructional centre. The new school building, shown in the photograph on page 205, is well situated on the aerodrome, for, as it faces the prevailing winds, flying operations are facilitated, and movement of machines on the ground is reduced to a minimum. The instructors' rooms and general offices command a complete view of the aerodrome, and consequently facilitate the recording of flying times and







This aerial photograph shows the new school building (with lawn, in foreground) in relation to the Bristol hangars and works. (Flight photograph).

maintenance of strict surveillance on all flying carried out over the aerodrome and the vicinity—matters essential to the satisfactory running of a school of this character.

The personal welfare of the pupil is not overlooked. Within the walls of the same building is housed a large and suitably furnished lounge, giving facilities for writing and study, while efficient stewards perform their duties, always welcome to hungry pupils, in a pleasant dining-room. Ample opportunities for recreation are provided; a large room is available for this purpose, and, in a separate building, there are squash courts. Luxurious lavatory accommodation includes baths and showers.

On the instructional side the new building contains armament and parachute rooms, together with an engine stripping and assembly room, and a main lecture hall, in addition to a section devoted to compass-swinging. A photographic department, in charge of an expert photographer, enables the results of pupils' air gunnery practice to be made rapidly available.

The school is under the control of Mr. C. F. Uwins, the manager and chief instructor, whose capabilities and experience as a pilot are too well known to need recounting. He has the assistance of a staff of qualified instructors and pilots, among whom might be mentioned Mr. C. T. Holmes and Mr. T. W. Campbell, two well-known figures

in the aeronautical world, and, until recently, the late Mr. C. R. L. Shaw, whose tragic and untimely death removed a charming personality from the school.

On the practical flying side the school is equipped with a fleet of twelve aircraft housed in large hangars and cared for by a staff of ground engineers and riggers.

Although at present solely concerned with the training of officers of the Royal Air Force Reserve, the syllabus followed is worthy of mention. It provides both annual and *ab initio* courses, and includes such subjects as air-manship (involving flying regulations), general knowledge of aircraft and engines, airscrew swinging, the use of parachutes, and machine and engine inspection and maintenance. Air pilotage, on the more practical side, embraces map reading and compass and instrument flying, while bombing, air gunnery and reconnaissance are further subjects which absorb the pupils' time, both from a theoretical and practical standpoint. Throughout the course the pupil receives a series of lectures under the guidance of Mr. C. T. Holmes.

During a recent twelvemonth the total number of instructional hours flown approximated to 4,500, while the number of pupils passing through the hands of the instructors was in the neighbourhood of 220, and this figure included a large number of *ab initio* trainees.

## Forthcoming Events

Club Secretaries and others are invited to send particulars of important fixtures for inclusion in this list.

- Feb. 27-28. R.A.F. Individual Boxing Championships, Uxbridge.
- Mar. 1. Annual Dance, Leicestershire Aero Club, Palais de Danse, Leicester.
- Mar. 1. "Fuels for Aircraft Engines." R.Ae.S. Lecture by Mr. E. L. Bass.
- Mar. 5. "Problems of Cold Presswork." Joint R.Ae.S. and Inst. A.E. Lecture by Dr. H. Gough and Dr. Desch.
- Mar. 6. Public Meeting at Stuart Hall, Norwich, on "Municipal Airport Development." (8 p.m.)
- Mar. 12. "Recent Developments in the Lighting of Airways and Aerodromes." Joint R.Ae.S. and Illuminating Engineering Soc. Lecture, Inst. M.E., Storey's Gate, Westminster.
- Mar. 15. "New Developments of the Autogiro." R.Ae.S. Lecture by Senor Juan de la Cierva.
- Mar. 15. Annual Dinner and Dance. Cinque Ports Flying Club Royal Pavilion Hotel, Folkestone.

- Mar. 23. Rugby: R.A.F. v. Army, Twickenham.
- Mar. 29. "Piloting Commercial Aircraft." R.Ae.S. Lecture by Sqd. Ldr. H. G. Brackley.
- Mar. 29. Annual Dinner. Norfolk and Norwich Aero Club, Mousehold Aerodrome.
- Apr. 12. "Commercial Aircraft." R.Ae.S. Lecture by Capt. G. de Havilland.
- May (Date not yet fixed). Wilbur Wright Lecture, R.Ae.S., by Mr. W. D. Douglas.
- May 29. Household Brigade Flying Club. Night - Flying Demonstration, Heston.
- June. 1. Brooklands "At Home."
- Aug. 24-25. Third International Flying Meeting, Lympne.
- Sept. 6-7. King's Cup Air Race.

## PRIVATE FLYING

LORD SEMPILL, F.R.Ac.S., DESCRIBES  
AERODROME AND WEATHER CONDITIONS  
ENCOUNTERED IN MALAYA DURING HIS  
AUSTRALIA FLIGHT

THE night after I arrived at Penang it rained continuously, and the aerodrome on the following day was in such a bad condition that I could not get off. As it was Armistice Day, and still raining, I decided to stay and attend the ceremony there, and devote the day to writing up my diary.

The next morning was little better, but I determined to leave if possible, and the effort nearly proved disastrous. As the aerodrome was so wet and muddy, the only thing to do was to try and take off from the roadway leading to it. This would have been quite practicable, but unfortunately my brakes jammed and prevented my gaining sufficient speed to clear a low wall. Luckily I managed to jump the ditch on to the aerodrome, but this little adventure completed the damage done to the tail wheel fork at Victoria Point. Fortunately I still had my spare fork intact, and I congratulated myself on the fact that I had not changed it on the previous occasion. This misadventure caused me to lose another day, as I had to overhaul the brakes as well as refit the tail unit. The binding of the brakes was, no doubt, due to the fact that mud and water had got into the drums during the previous wet landing.

With the help of the ground engineer, Mr. T. Foy, who had been loaned by the Singapore Flying Club, and a Chinese G.E. who was training, I managed to get the machine in shape for another try the next day. The mention of the loan of Mr. Foy serves to draw attention to the fine spirit of co-operation which exists between the flying clubs of Malaya. For myself, I have every reason to be grateful for all the help I received at Penang.

### At Singapore

AFTER the two days' delay I succeeded in taking the air next morning (in spite of the fact that it was the thirteenth of the month) and within a few hours was at Singapore. I landed at the Service Aerodrome, and was welcomed by my old friend, Group Captain (now Air Comdre.) Sydney Smith, who is in command of the R.A.F. units there. He and his family were extremely kind to me during my stay, and I was very glad to have the opportunity of seeing at close quarters the splendid efficiency of our Far Eastern Air Forces. The layout of the R.A.F. bays is well conceived, and the units are housed in remarkably good quarters. Air Comdre. Smith is to be congratulated on the excellent organisation maintained, and on the very fine spirit shown by the personnel, who are provided with every facility in the way of recreation, and are well looked after in every respect.

I also met another very good Service friend—Wing Cdr. Burling—whom I had last seen when he was at the R.A.F. Station at the Scilly Isles. He has organised a very fine sailing club, which numbers some fifty boats sailed by officers, N.C.O.s and men. The R.A.F. units at Singapore are a credit to all concerned, and the A.O.C. is indefatigable, not only in his fine work for military flying, but in his encouragement of civil aviation.

While I was there the Douglas machine which had done so well in the McRobertson Trophy Race arrived on its way back from Australia. The A.O.C. opened the aero-

## Down the Malay Peninsula

drome to the Dutch subjects who came in many motor coaches to pay homage to their compatriots Parmentier and Moll, who had so ably upheld the flying prestige of their country. They gave flowers to the crew and presented a silver tankard to each of the pilots. It was a great day for Dutch Nationals, who, incidentally, held the trade supremacy in Malaya for two centuries before British influence predominated in that region.

I had the privilege of meeting the Governor and the Colonial Secretary, and paid a visit to the site of the new civil aerodrome which, when finished, will be one of the most convenient and finest in the East. The layout has been extremely well designed, and will provide a run of a thousand yards in each direction. There is also an extensive and sheltered anchorage for seaplanes, so that, when fully equipped, Singapore will have some of the best combined land and seaplane facilities to be found anywhere. I found much enthusiasm for aviation in all quarters, and it is probable that before long a Director of Civil Aviation will be appointed to look after flying in the Malay States.

### The Naval Base

THERE may not be entire unanimity of opinion as to the necessity for the large expenditure involved in the present plans for the extension of the Singapore Naval Base, but there can be no doubt that there is every justification for any outlay which may be necessary to improve the ground organisation on this section of our Imperial Air Route.

With regard to flying within the Peninsula itself, my experience may have given the impression that conditions are generally most unfavourable. It must be remembered, however, that during November, the month I passed through, the rainfall is usually the heaviest of the year. It is true that Malaya averages about one hundred inches during the year, which is about three times the average in the British Isles, but the number of days per annum on which rain falls is little, if any, greater than in this country. The constant drizzle so common in Britain is seldom experienced in Malaya. The rainfall is usually intense, but rarely of long duration and often very local. The morning and early afternoon, even in the wet season, are generally characterised by bright sunshine.

### In Spite of Rain

THE amount of flying done by the clubs is an indication that climatic conditions are not so bad as might be supposed. During October, when over ten inches of rain fell, the Kuala Lumpur Club totalled nearly two hundred hours' flying for the month, which compares very favourably with clubs in this country.

The monsoon, as known in India and Burma, does not penetrate to the west and south of the Malay Peninsula, and it is free from the typhoons and cyclones which prevail in certain times of the year in the Bay of Bengal and the China Sea. A trying feature of the climate to Europeans is its monotony, as there are no defined cold and warm seasons. On the other hand, the excessively high temperatures prevalent in many parts of the tropics is not experienced, as the shade temperature does not usually exceed 90 deg. Fahr. by day and is generally well below 80 deg. Fahr. at night.



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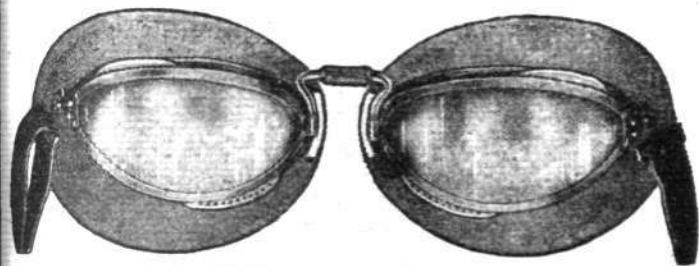
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# FROM THE CLUBS

## Events and Activity at the Clubs and Schools

### NOTTINGHAM

Flying time for the week amounted to 7 hr. 55 min., a slight decrease compared with the previous week, due to a strong gale which lasted three days.

The Spartan three-seater is in service again after its C. of A. overhaul. Extensions which are being made to the club will soon be finished.

### CINQUE PORTS.

Flying times for the week ended February 10 totalled 18 hours, while last week flying times, both dual and solo, totalled 25 hrs. 30 min. Mr. W. N. Yamamoto joined the club last week as a private-owner country member.

The club's annual dinner and dance is being held on Friday, March 15, at the Royal Pavilion Hotel, Folkestone.

### NORTHAMPTONSHIRE

The Beagle Meet at Sywell aerodrome was a great success, there being a field of over seventy. A dozen cars and five aeroplanes also took part in the Bandit Chase on Sunday, and, according to the results, it appears that the cars got the better of the machines.

During the week Mr. A. H. Simpson completed tests for his "A" licence.

### MIDLAND

Lectures on map reading are becoming very popular, and one will be given at Castle Bromwich on February 26, at 8 p.m.

Flying times for the week ended February 14 were 10 hr. 20 min. dual and 9 hr. 30 min. solo. Mr. W. Dawkins made a successful first solo. Six machines visited Castle Bromwich during the week.

### CAMBRIDGE

On Sunday ten members of the Civil Aviation Service Corps had the pleasure of seeing their first two soloists perform. Mascall was the first to achieve the solo stage, closely followed by Dew. The "hat trick" was expected, but the third member appeared too overcome with admiration for his colleagues to perform with his usual skill.

Flying times for the week were 29 hr. 15 min. dual and 5 hr. 10 min. solo.

### NORFOLK AND NORWICH

High winds did their best to prevent flying last week, but during the week-end members managed to put in a good number of hours.

A very enjoyable debate was held at the clubhouse, the subject being "That Record-breaking Flights are Still Justifiable." The result was that there were 31 votes for the motion and 15 against.

Arrangements have been made for the second Public Schools Aviation Camp to be held at Mousehold in August, and schools will shortly receive full particulars. A glowing account of last year's camp has been received by the club from Queensland.

### BRISTOL AND WESSEX

Lady Blanche Douglas landed at Bristol on Saturday, February 16, on her return flight from India with F/O. C. V. Ogden. The journey from Paris to Bristol was made in one "hop."

Ft. Lt. R. W. M. Hall, who has been chief instructor of the Bristol and Wessex Aeroplane Club since November, 1930, has resigned his appointment in order to join Imperial Airways as a pilot. "Jimmy" Hall came to the club straight from the R.A.F., and has trained over a hundred pupils. Mr. E. M. H. Slade, who in 1933 acted as assistant instructor to the club, and who has been chief instructor at the Whitney and Oxford Club, has been appointed his successor.

The club's annual Aviation Ball was held at the Grand Spa Hotel, Clifton, on Friday, February 15. The attendance was just over 325, which shows a large increase on any of the club's previous dances, and the organising Ladies' Committee is to be congratulated.

The dance music was provided by Jerry Hoey and his Piccadilly Grill Band, and exhibition dances were given by Mr. Thornton Tacey and his partner.

Lord Apsley, the president of the club, and Lady Apsley were present, and the guests also included Air Comdre. J. A. Chamier, and Sqn. Ldr. White, commanding 501 City of Bristol Special Reserve Squadron.

### HATFIELD

The club's flying time for last week was 59 hr. 25 min.

There was a good attendance at the Royal Air Force Flying Club's first annual dinner, held on Friday, February 15. During the week P/O. H. B. Alloway, F/O. L. E. V. Stonhill and Lt. R. B. Wainwright became members of the club.

### HERTS AND ESSEX

The competition for the Alexander Clark Casket will be held on Sunday, February 24.

For the fortnight ended February 16 the total flying time was 88 hours, 52½ hours of this representing solo flying. Mr. H. J. Bacon passed his "A" licence tests. New members include G. D. M. Benedetto (Italy), H. Clothia (India) and J. F. Bentley.

### BROOKLANDS

On Saturday, February 9, "The Bats" gave a very successful amateur dramatic show at the clubhouse. The performers are all members of the club, and the result was a lively and entertaining show. This was followed by an informal dance. On the following Sunday Miss Leonora Corbett, who takes the part of a record-breaking airwoman in a play now running in London, came down to take some instruction in a real aeroplane. Various members of the club flew up to Northampton for a landing competition.

Mr. Pardoe and Mr. Conway have completed their "A" licence tests, and three new members joined.

### LEICESTERSHIRE

One "Moth" is at Brooklands being fitted for "blind" and night flying, and will be back in service this week. All three machines are now equipped for night flying in preparation for the expected transfer to the Leicester Municipal Aerodrome next month.

The Chance combined revolving beacon and "shadow bar" floodlight has been installed and tested. It is announced that Provincial Airways will use the new aerodrome on their Hull-Southampton-Plymouth service. They will start operations on March 1, using Desford until Leicester is licensed. Royal Air Force support has been granted for the official opening in July.

The president, Mr. W. Lindsay Everard, M.P., gave a most interesting lecture to members on the preparation and organisation of a Continental air tour. Sir Harry Brittain, K.B.E., will give a lecture on March 15. The annual dance is on Friday, March 1, tickets being 5s. each.

The following have recently taken their "A" licences:—Mr. W. P. Thompson, Mr. P. L. Blackstone and Maj. E. D. Fanshawe, an old war pilot.

### SOUTHEND

Both the toast list and the menu were sufficiently long for last Friday's supper-ball, held by the Southend Flying Club, to be reasonably labelled a dinner-dance. More than 180 guests were present at the Queen's Hotel, Westcliff-on-Sea, and, judging from hints dropped during the short speeches, the future of the club is distinctly rosy.

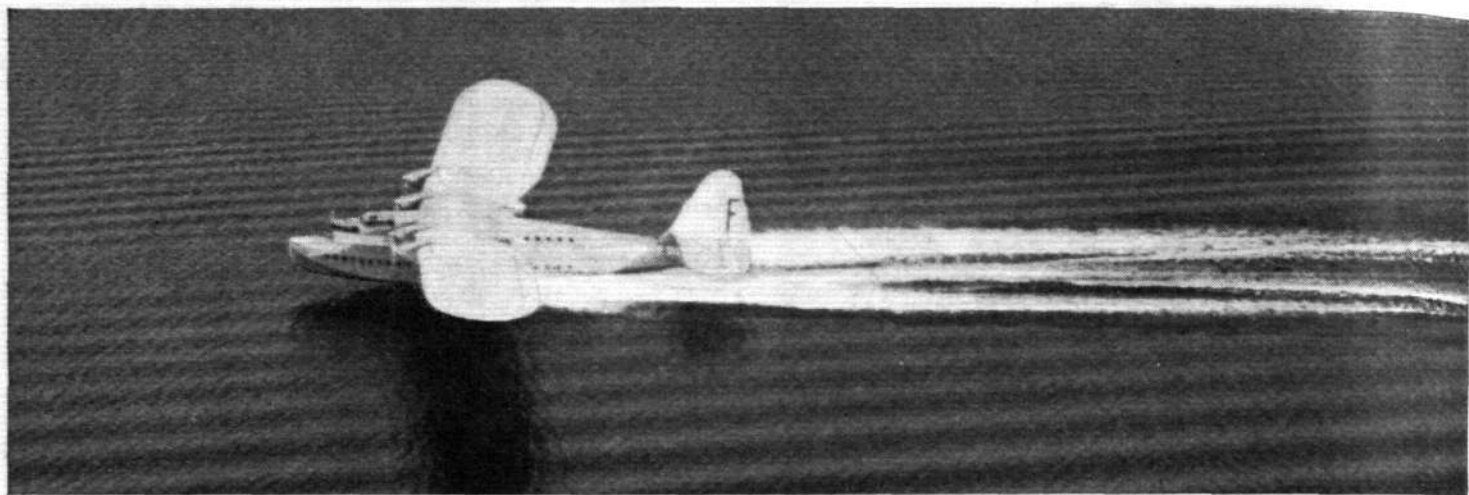
As the Mayor of Southend-on-Sea (Councillor A. T. Edwards) remarked, while proposing the health of the club, Southend's new airport will shortly be ready for occupation, though a good deal of work will still be necessary before the aerodrome itself will be fit for all classes of aircraft. In his reply, the president, Mr. G. E. Weber, spoke of the club's development. Mr. Brian S. Allen, of Henly's, Ltd., and Southend Flying Services, Ltd., proposed the toast of the Ladies and Visitors, while standing on his chair, and Mr. H. A. Taylor, of *Flight*, replied from a less lofty eminence.

Although Rochford aerodrome has served its purpose admirably, the hangar accommodation is distinctly limited, and the run in one direction is very short. When the surface is finished the new airport, which is within five or ten minutes' drive of Southend's centre, will have full-size runs and excellent approaches, though, during the early part of the summer, one patch only will be temporarily prepared for use.

The hangar is rapidly nearing completion, and in this there will be temporary, though luxurious, clubhouse accommodation. In due course a separate clubhouse will be built, though the hangar, as arranged at present, is roomy, and the use of a temporary screen across the living quarters allows a full expanse of floor for minor festivities. A verandah and the enclosed flight office will overlook the landing area.

# COMMERCIAL AVIATION

## — AIRLINES — AIRPORTS —



**LINES OF FORCE :** The Latécoere boat, *Lieut. Paris*, on the step during trials at Biscarosse. The extraordinary wave formation was possibly caused by the Latécoere's previous run along the same line.

### CROYDON

*Gales and "Records" : Noteworthy Arrivals and Departures : Seven-league Slippers : Burning Money*

**G**ALES again last week—and the inevitable crop of "record" or remarkably quick flights. D.L.H. pilot Kommol flew London-Amsterdam (I prefer that to "Croydon-Schipol" as being more sensible) in 63 minutes, and pilot Falke of the same company flew London-Cologne in 92 minutes.

Pilot Scholte, K.L.M., did London (airport of) to Rotterdam (ditto) in 1 hour 9 minutes, but the record for this trip is still held by K.L.M. pilot Both, who flew it some time back in 1 hour 2 minutes.

All these quick trips were on Friday or Saturday, but precious little was said about the long and tedious journeys in the other directions. One thing I heard from Parmentier, of K.L.M., was that no matter at what height he flew he could not make more than 90 km. per hour inwards to Croydon on Saturday afternoon.

Journeys against strong winds may be long, but are not uncomfortable if properly flown. One pilot flew at 4,000ft. in the height of the gale, and obtained absolute steadiness—not a bump until he had to come down to land over England's bump-producing contours.

Strong headwinds are an unmitigated nuisance, and one-way records do not help. I have even heard of a passenger demanding his money back because he enjoyed flying, and the company, by bringing him in half an hour too soon, had deprived him of that amount of aerial ecstasy for which he had paid.

Capt. Macintosh, of Spartan Air Lines, made the flight Cowes-Croydon in 28 minutes; this was despite detours which that wily veteran made to avoid country where bumps would be bad. The distance is sixty-eight miles.

The sixth and last D.H.86 for the Australia route was delivered at Croydon last week. It is to be flown out along the Eastern route by Capt. J. H. Lock, Imperial Airways, and Acting Captain H. C. Thomas, late Olley Air Service, Ltd.

Olley Air Service, Ltd., say that the spring rush has come. During the week-end the new "Rapide" went to Paris and was booked on from there to Geneva. Another trip was to Lausanne with an invalid, and a third to Edinburgh to fetch Mrs. Jack Hylton, whose band was performing at Kirkcaldy. Mrs. Hylton returned on Monday by a regular Railway Air Services machine. Mr. Jack Hylton, incidentally, came in from Holland by K.L.M. early in the week. The "Rapide" has done three or four jobs already and is in great demand.

A Persian, General Tschermoeff, left Croydon for Holland

early last week to fly home to Persia by K.L.M. In a Hague hotel he left his slippers, and wired back that they were to be sent on by the quickest means to Teheran. They were sent by air to Baghdad and thence, doubtless, by more primitive transport to Teheran.

Surrey Flying Services' "Puss Moth" G-ABHT left during last week for India, piloted by Capt. Hancock, the passenger being Mr. Gore, a S.F.S. pupil. The trip is *via* Nice, Corsica, and Tunis to Karachi and Nagpur. Capt. Hancock expects to be away a month.

On Saturday night, at 10 p.m. precisely, I watched the German night freighter take off for Cologne when the gale was at its height. The aeroplane, with navigation lights aglow, rose steadily and impressively into a sky of black, scurrying storm clouds and moonlight. A boat of similar (or even greater) tonnage would very likely have stayed in harbour under such conditions.

One of last week's notable passengers was the 78-year-old Marchioness of Aberdeen, who made her first flight from Paris by *Horatius*.

K.L.M. had a triplicate service in from Holland on Sunday, mostly carrying passengers for the British Industries Fair, which opened on Monday.

During bright sunshine on Sunday the neon beacon was working at full blast. Was this demonstration or test, or was it because the Air Ministry makes such huge sums by charging Bond Street rents for indifferent accommodation that there is "money to burn"? A. VIATOR.

### K.L.M. in 1934

Last year the Royal Dutch Air Lines carried 85,969 passengers, 2,385,070 lb. of freight and 507,000 lb. of mail. The increase of traffic during the past few years has been striking; in 1932 only 21,327 passengers were carried and there has been an increase of 106 per cent. on 1933.

On the Batavia service 79 per cent. of the available capacity was sold and the scheduled time was reduced to 7½ days.

After May 1 this year, it will be remembered, Douglas machines are to be used on the Batavia run, which will be made twice weekly to a 5½ days' schedule and carrying six passengers in long-distance comfort.



## HESTON

*Wireless Congestion : Drainage Operations at Ards : Crude Oil Experiment : Flying Neon Signs*

**R**ECENTLY, in a letter to *The Times*, Mr. Roderick Denman, technical director of Airwork, Ltd., called attention to the serious shortage of wavelengths for aviation wireless communication. He pointed out that a single television transmission occupied as much of the wavelength spectrum as eighty widely separated radio telephone channels. Less than one-tenth of this number is at present available for all communications between ground and air.

Before the internal air lines of Great Britain can finally be planned, it will be necessary to reserve wavelengths for communication and fog landing in order that the permissible spacing between aerodromes having wireless equipment may be known. Although there should be sufficient room for all in the ultra-short-wave band, signs are not wanting that if aviation does not stake its claim immediately, it will one day awake to find that ground-to-air television—which is even now technically possible and will almost certainly become practicable in a few years' time—has been elbowed out by entertainment broadcasts.

Mr. Denman had one other suggestion to make—that more use should be made of the country's land-lines for point-to-point communication between aerodromes in order to relieve the present congestion. This is at present too costly, but, as the matter is really one of arrangement between the Post Office and the Air Ministry, it should surely be possible to reach a satisfactory agreement.

The Ards airport, Belfast, has been closed for drainage operations since Thursday, February 14, for approximately three weeks. It will still be possible for light aeroplanes to use the airport at certain times, but no landing should be attempted

without previously consulting the airport manager (tel.: Newtownards 190).

M. Claudel crossed over from France last week to view the demonstrations of a "Gipsy III" engine running on crude oil with his Atomigaz carburetter. This experiment is being conducted at the Airwork Service depot at Bristol airport.

In a series of demonstrations last week, Air Commerce, Ltd. showed that the flying of neon signs is a practical and relatively inexpensive class of advertising. This firm fitted, on the under-side of a "Puss Moth's" wings, such illuminated letters. These were protected from shock by rubber suspension and backed by wood, with the object of preventing halation, and the equipment proved satisfactory in flight.

The Aeronautical Advertising Co., Ltd., of 9, Southampton Street, Holborn, has been formed solely to undertake this class of work. The D.H. "Dragon" to be used will be equipped with two-way radio telephony, and two pilots will be carried, both licensed to operate this type of wireless installation. Close touch will be kept with ground stations while flying neon signs, so that, in the event of misty weather, information may be received as to the clearest aerodrome on which to land and the gradual increase or decrease of visibility. The use of a twin-engined machine, lightly loaded, is a safeguard against forced landing in populated areas. Letters approximately four feet square will be attached to the underside of the wing. The firm will use the original high-tension neon signs of voltages up to ten or twenty thousand, constructed by Claude-General Neon Lights, Ltd. These signs have a very high penetrating power, and in four-foot letters are said to be legible up to 4,000 feet.

**The Congo Service**

On Saturday the first regular service will leave Brussels for the Belgian Congo. The machine to be used will be a Fokker F.7 (three Gnome-Rhone "Titans"), *Edmond Thieffry*, and the crew will consist of P. Cocquyt (commander), J. Schoonbroodt (first officer) and F. Maupertuis (wireless operator). For the time being mails alone will be carried.

**The Thames Ferry**

After a successful preliminary season, Southend Flying Services, Ltd., should be extending their field of operations during this season—possibly up the East Coast. They have taken delivery of a new Short "Scion" with Pobjoy "Niagara" to replace their D.H. "Fox Moth," and to match the "Scion" already being operated by Short Bros. over the Thames. This new "Scion," which, besides being fitted with more powerful engines, has been slightly modified in other directions, and has a considerably higher cruising speed. The nose shape has been altered, and a landing searchlight fitted.

In due course the Southend airport, on which work is pro-

gressing rapidly, will be used as their base. The airport is only five or ten minutes' drive from the centre of the town, and passenger accommodation will be all that is expected at an airport. The Southend Flying Club expect to move to the new quarters before or during April.

**Bridging the Gap**

Last Thursday the first regular all-air South American mail carried by Air France arrived at Croydon after a four days' journey. The *Bleriot Santos Dumont* is being used on alternate weeks.

**A Guernsey Service?**

Whilst the Guernsey authorities have been discussing the vexed question of laying out an expensive aerodrome, a new company, which is being formed to take over the existing Guernsey Aero Club, Ltd., is arranging to inaugurate a daily service from the small aerodrome already owned by this company. The chairman of the new undertaking will be Sir Alan Cobham.



**NEXT OF KIN:** The modified Short "Scion" which has just been delivered to Southend Flying Services, Ltd. Changes in the shape of the nose, in which a landing light is fitted, and the fact that the engine nacelles are now in the centre line of the wing section account for the improved performance.

**Commercial Aviation****AIR FRANCE PLANS*****New Services to Tunis, Geneva, Central Europe and Spain : An Extension from Bangkok to Hanoi : Night Mail to Paris***

**A** NUMBER of interesting changes and improvements can be discovered from a close study of Air France's provisional summer time-table, which has just been published.

In addition to the normal day service, which leaves London at 10.30 a.m. (instead of 10 a.m.) and reaches Cannes at 5.20 p.m., a new service will be opened on April 1, whereby passengers will be able to reach Tunis in the shortest possible time. This service will leave Croydon at 7 p.m. and arrive in Tunis at 6 p.m. on the following evening, the hotel charge in Paris being included in the fare. The same system is used for an extra service to Geneva, arriving at 10 a.m., in time for a full day there. The whole flight from Casablanca, via Tangiers and Marseilles, is now completed on the same day.

The Central Europe service, too, leaves Croydon at 7 p.m., arrives at Vienna at 12.40 p.m. on the following day, and Stamboul on the second morning. The last section is flown

only on Thursdays and the Paris hotel is again included in the fare. Another new service leaves London at 1.30 p.m. and, with the help of the Spanish Air Co., arrives at Madrid at 6.50 p.m. Air France has now joined with Sabena in a Scandinavian service which completes the journey from London to Copenhagen daily in time for connections with Stockholm, Gothenburg and Oslo.

During the early part of the summer the Paris service is scheduled at 1½ hours, but later, when the new Dewoitine machines are put into service, the time will be considerably reduced. Fares throughout have been reduced and the baggage allowance has been increased from 33lb. to 44lb.

Air France, incidentally, have extended their weekly Bangkok service to Hanoi, and it is probable that the line will reach Hong Kong before the end of the season. A new night freight and mail service between London and Paris will be started this year.

**A Fedder Line for Malaya?**

This year it is probable that a passenger service between Singapore and Penang will be opened. Mansfield and Co., Ltd., agents for Imperial Airways, Ltd., are the firm behind this development. Calls would probably be made at Malacca, Kuala Lumpur and Sitiawan, with a possible extension to Alor Star.

**Customs at Southampton**

Atlantic Park (Eastleigh) has been approved as a Customs aerodrome. Notice should be sent on the previous day if the services of an officer are required. The regular daily attendance of an officer at Penshurst, incidentally, has been discontinued. Customs can be cleared, in case of emergency, by the officer from Croydon.

**Egyptian Air Lines**

During the week ended February 3, 111 passengers were carried on Mistr Airwork's lines to Alexandria, Palestine, and Upper Egypt, and the services were run to schedule despite gales and extremely bad weather. For some time, incidentally, shipping was prevented from entering the harbours at Alexandria and Port Said.

**Ceylon's Aerodrome**

Work on the construction of the aerodrome at Ratmalana has been temporarily postponed owing to difficulties arising regarding the acquisition of the necessary land. The situation has been complicated by a rise in the value of the land which is to be acquired, and by the fact that a larger area than that originally contemplated has been recommended for acquisition.

**Swissair during 1934**

Last year the Swissair Company machines flew 519,709 miles in regular service as against the 479,078 recorded for 1933. 17,764 passengers were carried—an increase of 4,761 on the previous figures. In other words, the passenger miles had increased by 29 per cent. An average of 42.5 per cent. of the available load capacity was filled on all machines. In addition, 3,526 passengers were carried on special and charter flights, as against 2,204 for 1933.

**Jodhpur Aerodrome Improvements**

The scheme to develop the control and lighting installation on the Jodhpur aerodrome was considerably accelerated before the Melbourne race, and since that time the State officials have been engaged in perfecting the different units of the equipment.

The landing area has been extended and runways laid down. A control tower block has been erected on a site which commands all lines of approach and departure, and will, moreover, allow for additional hangar accommodation without affecting the landing area. In this building are situated a reception hall, electrical sub-station, offices for the agents of the airlines, and facilities for meteorological observations.

This control room is connected with the electrical installation by means of a desk control panel, the push-buttons on which operate contractor switches in the sub-station. The panel also includes a device, operated from the wind "T," which indicates the wind direction at any moment.

**In New Zealand**

While in 1929 there were only two licensed aerodromes in the Dominion of New Zealand there are now twenty-seven and fifteen others have temporary licences.

Some of the smaller grounds on the west coast of South Island are to be used by Cook Strait Airways, Ltd., on their southward extensions. By this time the company should have obtained the air service licence for which it applied on February 5; their services will consist of a daily one between Nelson, Blenheim and Wellington, and another to be operated three times a week, between Nelson and Hokitika. The "cross-channel" service will connect with East Coast Airways' line between Palmerston North and Dunedin, with stops at Blenheim and Christchurch. Air Travel (New Zealand, Ltd.), may, too, operate a west coast service from Hokitika. East Coast Airways, Ltd., which, incidentally, according to the magazine *Wings*, obtained a full subscription for its capital issue of £15,000, has as its primary object a service between Napier and Gisborne.

To the various flying clubs of New Zealand must go the credit of pioneering commercial aviation in the Dominion. They have prospected landing grounds and have done a very great deal of charter work during the past few years.

**A.B. Aerotransport F22**

Since an illustration of the first Fokker F.22 *Lapland* which has been ordered by A.B. Aerotransport, was published in *Flight* of January 10, some further information has been received. *Lapland* is fitted with duplicated instruments, including a Kollsman sensitive altimeter and a Pioneer rate of climbing indicator, the gyroscopic instruments being operated by engine-driven vacuum pumps, and fire-extinguisher equipment is provided for each engine.

A Phillips 900 m. two-way radio set, arranged for telephony and telegraphy, is fitted, with both fixed and trailing aërials—telephony being available for the first officer. As in the case of the F.36, the pilot's seats are arranged in offset tandem giving the first officer an unrestricted view in all directions.

There are four passenger cabins, each providing comfortable accommodation, with tables, for five or six persons. Forward of the cabins there is a steward's compartment and luggage hold. Great care has been bestowed on the ventilation system, both cold and warm air being supplied, and the whole fuselage is sound-proofed.

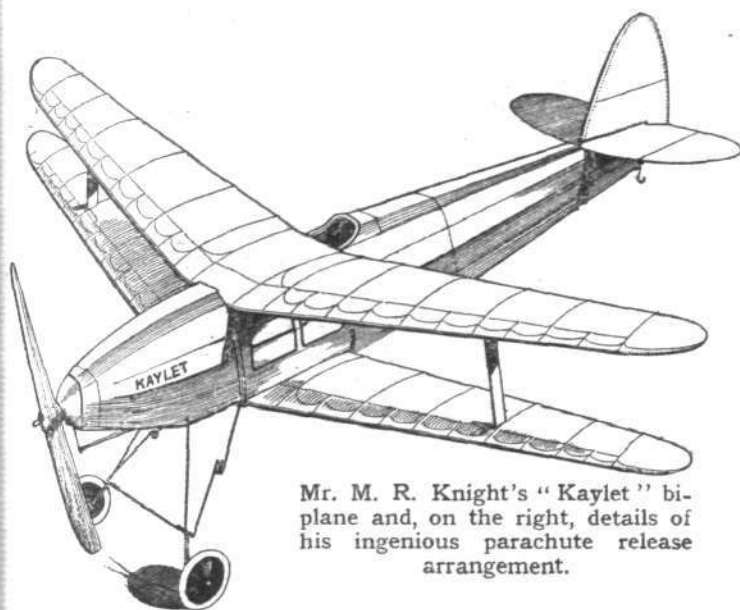
The performance and loading figures of the F.22, three of which are also to be supplied to K.L.M. for their Eastern service, are when fitted with four Pratt and Whitney "Wasps," as follows:—

Empty weight (including equipment)	19,250 lb.
Crew of four	680 lb.
Fuel (475 galls.) and oil	4,020 lb.
Pay load	4,800 lb.
Maximum speed (2,100 r.p.m.)	160 m.p.h.
Cruising speed (1,900 r.p.m.)	140 m.p.h.
Landing speed (flaps down)	64 m.p.h.
Take-off and landing runs	920 ft.
Range (475 galls.)	685 miles
Range (600 galls.)	870 miles



# MODELS

## A Parachute-dropping Biplane : Club News : Competitions for 1935



Mr. M. R. Knight's "Kaylet" biplane and, on the right, details of his ingenious parachute release arrangement.

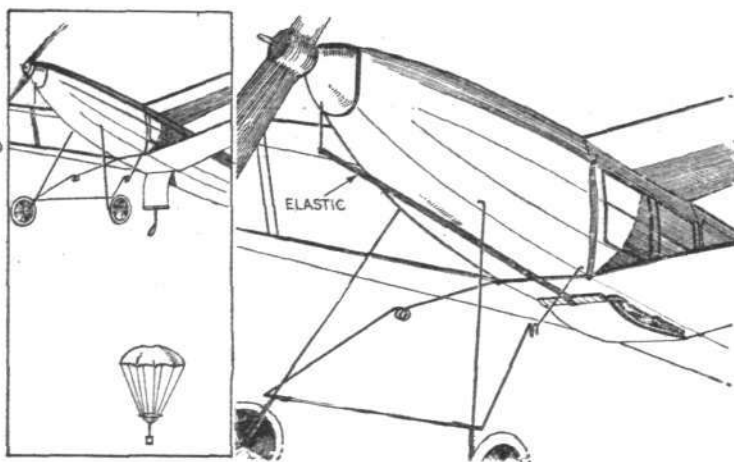
### MODERN MODELS

#### The Knight "Kaylet" Biplane

**A** GENERAL-PURPOSE, all-weather biplane—which has been much in evidence during the past season at Hackney Marshes, Stag Lane, and Wimbledon—designed by Mr. M. R. Knight, joint Hon. Secretary of the Model Aircraft Club (T.M.A.C.), the "Kaylet" is constructed of birch and spruce, with balsa ribs. The top and bottom wings are of equal span, of comparatively high aspect ratio, tapering sharply towards the tips along the leading edge—not unlike those of recent De Havilland commercial machines.

The wings are mounted on the top and bottom of the fuselage by the usual elastic bands, allowing them to be knocked back-in the event of collisions or heavy landings. A single inter-plane strut is fitted each side of the fuselage, each strut being mounted in a socket on the lower wing and not actually joining the upper wing, so that although the strutting definitely steadies the wing structure—especially in a wind—no damage to wings or struts results when the wings are accidentally displaced.

The fuselage is multi-sided instead of slab-sided, with open cockpit and cabin windows. The undercarriage is of the usual



steel wire "rocker" type, collapsible. In the model illustrated the tail unit consists of a separate fin and tail plane constructed of 22 S.W.G. steel wire covered with "aluminiumed" oiled silk, but a built-up double-surfaced tail unit has also been successfully employed.

This model is fitted for parachute releasing, the parachute being carried, folded, in a flap pocket under the fuselage and released in the following manner: The flap is held closed by an elastic band which fits over the extremity of a length of wire extending downwards from the propeller nose-piece. When fully wound the tension of the rubber motor holds the nose-piece firmly in position, but as the motor unwinds the tension of the flap elastic pulls the wire rearwards (slightly displacing the nose-piece, which is now held less firmly in position) until the elastic slips off and thus allows the flap to open, releasing the parachute. As many as four parachutes have been released at the same time—on one occasion during an R.O.G. flight.

The "Kaylet" has a good speed and climb, especially with an 8in. propeller—10in. and 12in. propellers giving longer flights—and its best duration has been 65 seconds. Some forty different people have "piloted" this model. It has a flat glide, is very stable and easy to fly. A new version is now under construction. The principal characteristics are:—

Span ...	...	33in.	Overall length ...	24in.
Chord ...	...	1½—3½in.	Stagger ...	¼in.
Gap (max.) ...	...	3½in.	Dihedral (top) 4 deg., (bottom) 6 deg.	
Weight ...	...	6 oz.	Duration ...	65 secs.

### MODEL PETROL ENGINES

**A** PUBLIC lecture and discussion on "Miniature Internal Combustion Engines" will be held at the Junior Institution of Engineers, 39, Victoria Street, London, S.W.1, on Thursday, March 7, at 7.30 p.m. The speaker will be Mr. Edgar T. Westbury, M.J.Inst.E.—well known to aeromodelists—and the chairman will be Professor A. M. Low. All persons interested in modern developments of small internal combustion engines for model aircraft, power boats and other purposes should find attendance well worth while.

### S.M.A.E. ANNUAL GENERAL MEETING

**T**HE Annual General Meeting of the Society of Model Aeronautical Engineers was held on February 13, when the Secretary's and Treasurer's Reports were adopted. The season 1934 had been one of exceptional interest: the Wakefield Cup was won for Great Britain by Mr. Allman, of the Leamington and Warwick M.A.C., against a field of British, French and American competitors; British models, flown by proxy, gained 6th, 8th, 9th and 10th places in the Moffett International Trophy contest, held at Akron, U.S.A.; the Farrow Inter-Club Shield was won by the Manchester M.A. Society; the seaplane contest attracted numerous entries, and was responsible for some really excellent flights; the power contest showed progress, and resulted in a record being established by Capt. Bowden; Mr. Crow, of the Blackheath M.F.C., set up a record, the first of its kind, for wingless fuselage Autogiros.

The following officers were elected to serve for ensuing year: President, Dr. A. P. Thurston; vice-presidents, A. F. Houlberg, G. Geoffrey Smith, M.B.E.; chairman, B. K. John-

son; vice-chairman, R. N. Bullock; hon. secretary, E. F. H. Cosh, 35, Maple Crest, Sidcup; treasurer, W. E. Evans; competition secretaries, B. K. Johnson, S. G. Mullins; competition reports secretary, M. R. Knight; technical secretary, R. N. Bullock; council, R. Langley, A. J. Stevens, A. M. Willis, H. York, L. A. Wood.

### COMPETITIONS FOR 1935

**T**HE S.M.A.E. has announced the following competitions to be held during the present year:—

- April 22 —Eliminating Trials for Moffett Trophy (St. Louis, U.S.A., June 29), at Fairey's Aerodrome, 3 p.m.
- May 12.—Gamage Cup (General Duration), Wimbledon Common, 3 p.m.
- June 16.—"Model Engineer" Cup No. 1 (Gliding), Ivinghoe Beacon, Tring, 3 p.m.
- July 7 —Sir John Shelley Cup (Power-driven), Fairey's Aerodrome, 3 p.m.
- Aug. 4.—National Cup (S.M.A.E. Cup), Fairey's Aerodrome, 3 p.m.
- Aug. 5.—International Wakefield Cup, Fairey's Aerodrome, 4 p.m. (Eliminating trials, 11 a.m.)
- Aug. 25.—C.S.S.A. Cup (Scale Models), Blackheath, 3 p.m.
- Sept. 8.—Lady Shelley Cup (Seaplanes), Danson Park, Bexley Heath, 3 p.m.
- Sept. 29.—Flight Cup (Speed), ground to be announced later.

— Farrow Shield Inter-Club Contest. Dates (up to Oct. 31) and grounds fixed by affiliated clubs.

# THE INDUSTRY

## AMAL AIRCRAFT ACCESSORIES

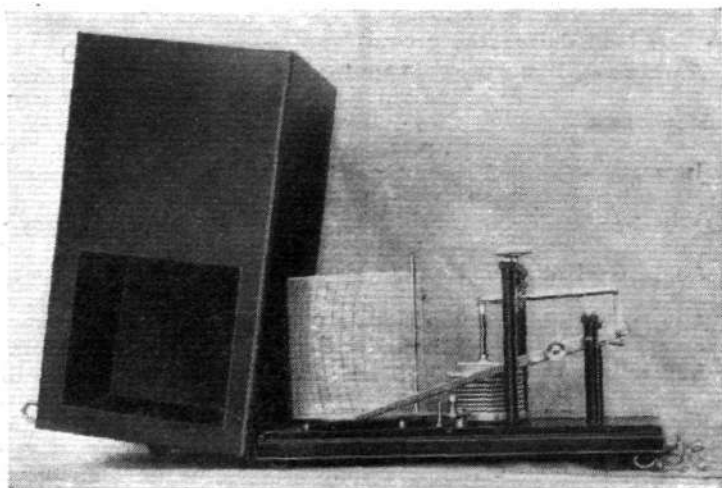
**OUTSTANDING** among those items in the range of accessories manufactured by Amal Ltd., of Birmingham, which are applicable to aircraft is a duplex fuel pump, approved by the Air Ministry for use on civil aeroplanes. This device gives a maximum delivery of 200 pints per hour from one pump, the other being in reserve; if occasion demanded, both pumps could discharge simultaneously. There is a single suction pipe and two independent diaphragm pumps operated by a single cam. The weight is surprisingly low, being approximately 4 lb. 10 oz. Amal fuel pumps were fitted to the D.H. "Comets" for the England-Australia race, and, incidentally, flame traps of the company's manufacture, as described in *Flight* of January 24 last, were also specified for these machines. Flowmeters, jet calibrating machines, jets and ball and roller joints are other Amal accessories which should be of interest to manufacturers and operators of aircraft and aero engines. A recent production is a new type of Bunsen burner—a useful article in any workshop—giving a perfectly controlled flame which may be turned down low without "flashing back." This embodies in its neck what is virtually a miniature "flame trap."

## A COMPACT ALTIGRAPH

Aneroids are devices for which the world in general and aviation in particular may be truly thankful. Short and Mason, Ltd., at their "Aneroid Works," London, E.17 (which, incidentally, are being considerably extended), are manufacturing, and have done so for over 75 years, a wide range of these and kindred instruments. It is only natural that some of the most outstanding instruments produced by the firm are associated with the measurement and recording of height.

One of the most recent of these is a portable altigraph, which has been introduced to meet the requirements of private owners, aero clubs, and aircraft operators for whom the large Service type altigraph might be too cumbersome and expensive. This new instrument, the purpose of which is to record altitude with reference to a time base, is operated on a similar principle to that employed in the altimeter, and utilises an aneroid. The aneroid, of course, may be regarded as a chamber from which the air has been exhausted. Its thin metal walls respond to any variation of external pressure. This movement of the walls—directly corresponding to the external pressure—is transmitted and magnified by a system of levers to a pen, which is mounted so as to mark with a special anti-freezing ink a paper chart placed round a drum which is revolved once every hour by a clockwork mechanism mounted in its centre. This chart has a base line marked for time, and may be graduated in 200 ft. divisions from 0 ft. to 8,000 ft., or from 0 ft. to 15,000 ft. Metric markings are also available. All the components of the altigraph are mounted on a base board, and are enclosed by a case hinged at one end and provided with a "window" through which the chart may be read. There are attachments at the top and bottom for suspension purposes, and a pen "throw off," for removing the pen from the chart, is operated from the outside.

Complete, the instrument only weighs 2½ lb., and its overall



Short and Mason's portable altigraph, which is particularly suitable for the private owner, clubs and schools.

dimensions are 7½ in. x 4½ in. x 4 in. Each instrument is supplied complete with set of charts, ink and pen.

## SECRETARY FOR GENERAL AIRCRAFT

It is announced that Mr. Noel Brown has been appointed the secretary of General Aircraft, Ltd., of Feltham, Middx.

## THE HENDY "HECK"

Aircraft Exchange and Mart, Ltd., of 7, Park Lane, London, W.1, are the sole concessionaires for the Hendy "Heck," which is described in this week's issue of *Flight*, on page 196.

## "CERRIC" CELEBRITIES

Cellon, Ltd., of Kingston-on-Thames, have just issued two useful pamphlets—"Cellon Products for the Finishing of Aircraft" and "Dopeproof Tape." The former gives in tabular form suggestions for finishing the various structural materials used in the aircraft industry, and should be of considerable use for all finishing shop superintendents. The latter describes the use of dopeproof tape as a substitute for dope-resisting paint, as approved by the Air Ministry.

## MR. WHITNEY STRAIGHT AND MONOSPARS

Mr. Whitney Straight, one of the best-known younger men in motor racing and aviation, has joined the board of General Aircraft, Ltd. It is understood that he will take an active part in the administration of the company.

Mr. Straight is an experienced pilot, and it is stated that he intends to purchase one of the new S.T.18 Monospars for his own use; he is to carry out some revolutionary ideas in interior equipment and decoration of this machine.

## NEW COMPANIES

**YORKSHIRE GLIDING CLUB (PROPRIETARY) LTD.** Capital £100 in 10 shares. Objects: To acquire an interest in the freehold land and premises at Sutton Bank, Yorkshire, and use for the purpose of gliding, soaring and aviation, etc. The Directors are:—Charles S. Craven, 43 Ambleside Avenue, Bradford; Arthur M. Verity, 139, Norman Lane, Bradford; Norman H. Sharpe, Stephen Royd, Apperley Bridge, Rawdon, Yorks. Solicitors: Ralph C. Yablon, 77, Market St., Bradford.

**LEAMINGTON, WARWICK & DISTRICT AERO CLUB, LTD.** The Aerodrome, Bishops Tachbrook, near Leamington Spa. Capital £1,000 in £1 shares. Objects: To promote, encourage and develop the sport, science and practical application of aviation and aeronautics; to enable its members to learn and practise the art and science of flying, etc. The directors are:—Major Julius E. Bonniksen, 21, Brunswick Street, Leamington Spa. (Ex Squadron Leader, R.A.F., G.A.P.A.N.); Herbert E. Rhodes, 62, Holly Walk, Leamington Spa; Kenneth J. Douglas, Inbale, Claverdon, Warwickshire. Secretary: Edna V. G. Bonniksen. Solicitors: James Kentish & Atkins, 31, Temple Row, Birmingham, 2.

## PUBLICATIONS RECEIVED

*L'Aéronautique en Pologne.* By Bogdan J. Kwiecinski. Varsovie, 1935. Poland: L'Aeroklub Rzeczypospolitej.

*Meteorological Office Geophysical Memoirs*, No. 63. *Wind Records from the Rock Lighthouse.* By A. H. R. Goldie. Price 2/6 net. London: H.M. Stationery Office, W.C.2.

*Report of Proceedings of the National Safety Congress 1934.* Price 5/- net. London: The National "Safety First" Association, 52, Grosvenor Gardens, S.W.1.

*Automobile & Aircraft Engines.* By A. W. Judge. (Third Edition). Price 4/- net. London: Sir Isaac Pitman & Sons, Ltd.

*L'Année Aéronautique, 1933-1934.* By L. Hirschauer and Ch. Dollfus. 15 Années. Paris: Dunod, Editeur, 92, Rue Bonaparte.

*War Flying in Macedonia.* By Haupt Heydemarck. Price 7/6 net. London: John Hamilton Ltd.

*Flying Minnows.* By Roger Vee. Price 12/6 net. London: John Hamilton Ltd.

*Smithsonian Miscellaneous Collections*, Volume 93, No. 4. *Pioneer Wind Tunnels* By N. H. Randers-Pehrson. U.S.A.: The Smithsonian Institution, City of Washington.

*La Preparazione del Motore del Primo di Velocità.* (Fiat A.S.6.) By Dott. Ing. Ernesto Vandone. December, 1934. Italy: Istituto Poligrafico dello Stato Libreria, Rome.

## AERONAUTICAL PATENT SPECIFICATIONS

Abbreviations: Cyl. = cylinder; i.c. = internal combustion; m. = motor. (The numbers in parentheses are those under which the specification will be printed and abridged, etc.)

### APPLIED FOR IN 1933

Published February 21st, 1935.

Complete Specifications now open to Public Inspection. (Secret Patents Re-Assigned to the Inventor.)

28422. BIAS BINDINGS CO., LTD., and TURNER, J. Kites. (422,970.)  
33601. BLACKBURN AEROPLANE & MOTOR CO., LTD., and BUMPUS, F. A. Aircraft fuselages. (423,060.)

34560. BLACKBURN AEROPLANE & MOTOR CO., LTD., and METCALFE, L. E. Liquid contents gauge for tanks. (422,976.)  
36596. RUOLLE, M. A. Aeroplanes. (422,980.)

### APPLIED FOR IN 1934

552. BLACKBURN AEROPLANE & MOTOR CO., LTD., and RENNIE, J. D. Water stabilisers for flying boats. (422,982.)

15671. BREGUET, L. Aircraft with rotating-wing systems. (423,005.)

22187. REYMOND, H. C. Device for recording the displacements in longitude and in latitude of ships and airships. (423,227.)



# FLIGHT

## MISCELLANEOUS ADVERTISEMENTS

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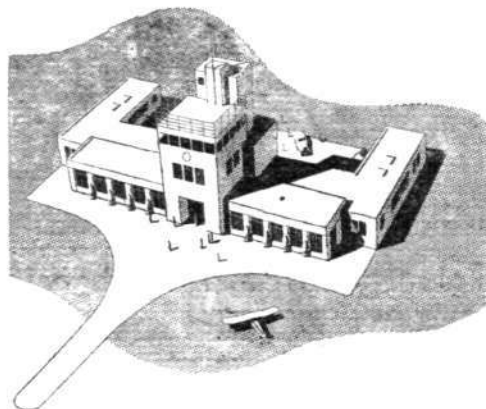
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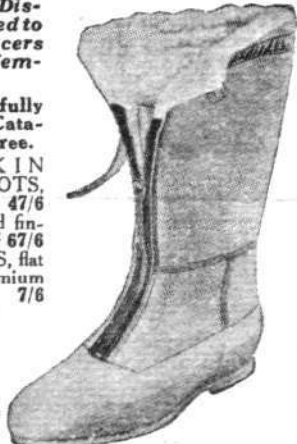
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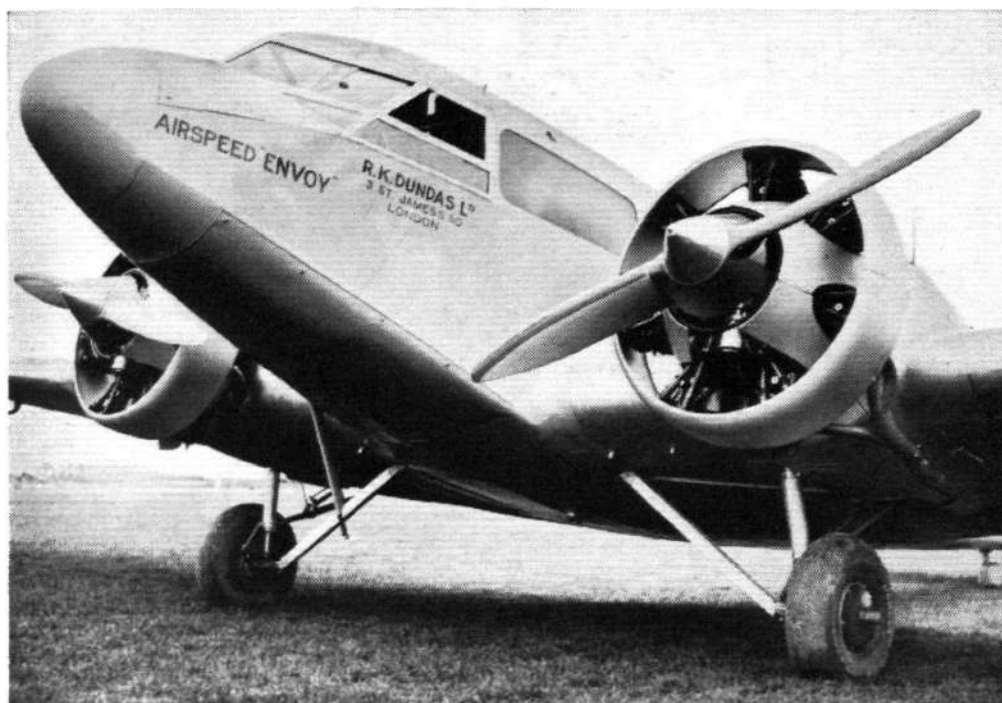
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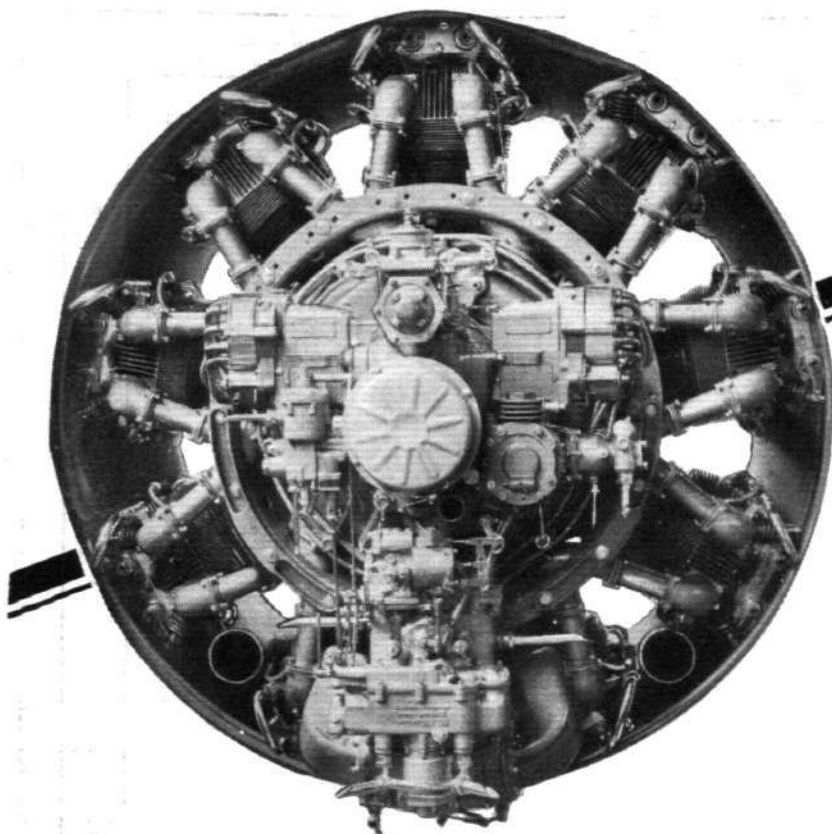
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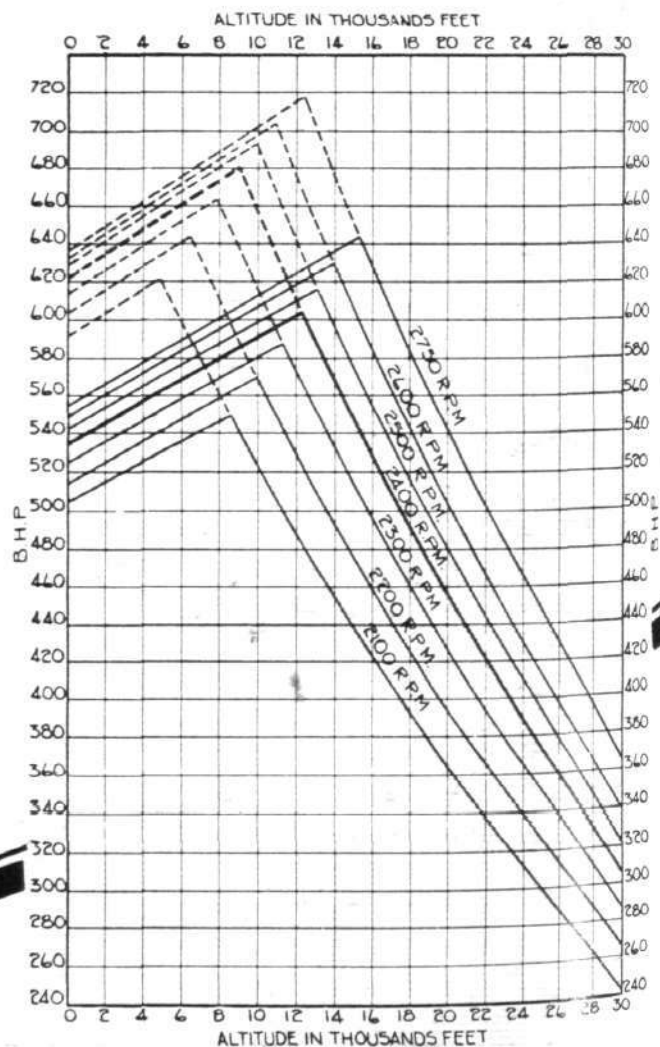
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B.H.P. for take-off at Sea Level at normal r.p.m. . . . .	590/620
Rated Output at normal r.p.m. . . . .	575/605 at 12,500 feet
B.H.P. at maximum r.p.m. . . . .	615/645 at 15,500 feet
Fuel Specification . . . . .	D.T.D. 230
Minimum octane value . . . . .	87

Designed and Manufactured by  
**THE BRISTOL AEROPLANE CO., LTD.,**  
FILTON, BRISTOL.

Telegrams: "Aviation, Bristol."  
Telephone: Bristol 45051.



#### MERCURY VI-S POWER AT ALTITUDE.

STANDARD TEMPERATURE & PRESSURE CONDITIONS.  
--- MAXIMUM POWER AVAILABLE FOR TAKE OFF & CLIMB.  
— POWER AVAILABLE WHEN RATED BOOST IS NOT EXCEEDED.